

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



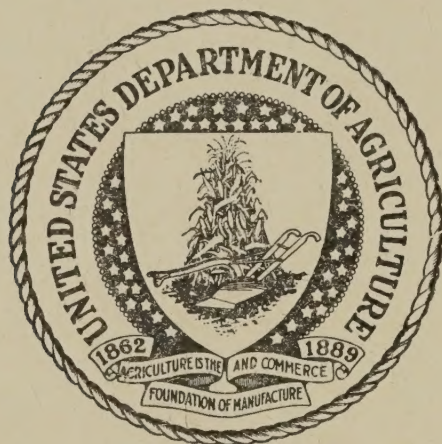






H-25

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
LIBRARY



23  
BOOK NUMBER Q33  
v.22  
Jan.-June 1909  
115312

ero 8-7671

INV. '60





















THE  
QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE.

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOLUME XXII.

---

JANUARY TO JUNE, 1909.

---

BRISBANE:

BY AUTHORITY: ANTHONY JAMES CUMMING, GOVERNMENT PRINTER, WILLIAM STREET.

1909.

4461  
1917  
1918

# QUEENSLAND AGRICULTURAL JOURNAL.

VOL. XXII., PARTS 1-6.

## GENERAL INDEX.

	Page.		Page.
<b>A.</b>		<b>B.</b>	
A Codlin Moth Parasite ... ..	44	Banana Margerine ... ..	322
A Curious Cow ... ..	297	Banks, Agricultural Credit ... ..	230
A Fine Pear Tree ... ..	309	Bedrooms, Plants in ... ..	44
A Large Station ... ..	146	Beating the Fruit Fly ... ..	83
A Lost Orchid Rediscovered ... ..	308	Bee Notes ... ..	30, 85
A New Casein Test ... ..	142		
A New Double-headed Wheat ... ..	139		
A New Fibre-extracting Machine ... ..	263		
A New Mango ... ..	84		
A New Valuable Clover ... ..	126		
A Novel Mouse-trap ... ..	102		
A Prolific Wheat ... ..	125		
A Rusty Tank, How to Treat ... ..	267		
A Seventy-five Bushel Wheat Crop ... ..	4		
A Story of Two Cows ... ..	12		
A Water-weed Cutter ... ..	45		
Abortion, Contagious ... ..	317		
Acacias and Poincianas ... ..	267		
Acre of Land, Quantity of Seed Potatoes			
Required to Plant an ... ..	179		
Acute Tympanites (Hoven or Blown) ... ..	103		
Agricultural Credit Banks ... ..	230		
Agriculture ... ..	1, 55, 117, 175, 219, 275		
An American's Address to Farmers'			
Boys ... ..	134		
An Enormous Grapevine ... ..	186		
Analyses of Ensilage ... ..	195		
Analyses of Dip Fluids ... ..	XI		
Analyses of Fertilisers ... ..	260		
Analyses of Spear, and Blue Grasses and			
Molasses ... ..	268		
Analysis of Carrots ... ..	168		
Analysis of <i>Phalaris commutata</i> ... ..	228		
Analysis, Rough, of Soils ... ..	324		
Angora Goats ... ..	65		
Animal Pathology ... ..	103		
Another Drought Predicted ... ..	41		
Another New Clover ... ..	139		
Answers to Correspondents ... ..	46, 109, 167, 205, 267, 324		
Apiculture ... ..	30, 85, 152		
Apples, Codlin Moth-proof ... ..	151		
Apricot-growing in Brisbane ... ..	19		
Arrowroot-growing in Queensland ... ..	1, 59		
Asparagus, Winter ... ..	233		
Australian Honey in London ... ..	85		
"Australian Sugar Journal" ... ..	239		
		<b>C.</b>	
		Calendar of Flower-gardening ... ..	24
		Candle-nut Tree ... ..	37
		Cane Farmers, Subsidiary Crops for ... ..	95
		Cane Harvester, The "Pessou" ... ..	99
		Care of Horses ... ..	238
		Carrots, Analysis of ... ..	168
		Caravonica Cotton ... ..	164
		Casein Test, A New ... ..	142
		Cassava, Cultivation of ... ..	310
		Cassava as a Food-stuff ... ..	47
		Caterpillars, Destroying ... ..	299
		Cattle, Cure for Blight in ... ..	204
		Cement from Soap Waste ... ..	93
		Cereals, Winter, Experiments with at the	
		State Farm, Roma ... ..	117
		Chemistry ... ..	228, 260, 268
		China, Forests of ... ..	255
		China, Frozen Pigs from ... ..	205
		Choosing a Dairy Bull ... ..	140
		Chopped Sugar-cane as Fodder ... ..	110
		Clipping Horses ... ..	69
		Clover Plant, A New Valuable ... ..	126
		Clover Plant, Another New ... ..	139
		Clover, Tropical ... ..	268
		Coal Tar for Pumpkin-beetles ... ..	166
		Coast Lands, Wheat-growing on ... ..	176
		Cocoanut Culture ... ..	196
		Cocoanut-planting in Samoa ... ..	37
		Codlin Moth, Fighting the ... ..	151
		Codlin Moth Parasite ... ..	44
		Beetle, The Pumpkin, Destruction of	
		the ... ..	39, 111
		Beetles, Tomato ... ..	205
		Best Pork-producing Ration ... ..	142
		Biggenden State Farm ... ..	130
		Bird, A Sparrow-destroying ... ..	42
		Blight in Cattle, Cure for ... ..	204
		Boll-worm, the Cotton, To Combat ... ..	179
		Bones, Fractured, in Dogs ... ..	320
		Bordeaux Mixture, A New ... ..	83
		Boring a Hole through Glass ... ..	109
		Boring Insects ... ..	109
		Botany ... ..	28, 147, 187, 316
		British New Guinea as a Planting	
		Country ... ..	32
		Broken Bones of Horses ... ..	143
		Broken Bones of Dogs ... ..	320
		Broodiness in Hens, To Cure ... ..	185
		Bull, Choosing a Dairy ... ..	140
		Burning out Stumps ... ..	321
		Butter, Export of ... ..	12
		Butter Boxes, Straw ... ..	297
		Butter, The Value of Grading ... ..	295
		Buying Poultry ... ..	299



	Page.
Codlin Moth-proof Apples	151
Common Sense in the Poultry-yard	74
Commonwealth, Official Year-book of the	
Concrete, Reinforced	106
Contagious Abortion	317
Contributions to the Flora of Queens-	
land and New Guinea	28, 147, 187, 316
Cork Waste	82
Corn Judging	226
Correspondents, Answers to	46, 109, 187, 205, 324
Cost of Fertilisers for Maize	325
Cotton Boll-worm, To Combat the	179
Cotton, Caravonica	164
Cotton from Normanton	48
Cotton-growing	135
Cotton-picking	94
Cotton, Method of Estimating the Yield	
of in the Field	229
Cow, A Curious	297
Cow, Daily feeding Ration for	293
Cow, The Hereford as a Dairy Breed	10
Cow, What a good Cow should yield	322
Cows, A Story of Two	12
Cows, Dehorning	296
Creation of a New Strawberry	267
Crop, Failure of the Potato	111
Crops at "Hermitage" State Farm	60
Crops, Farm, As Food for Stock	126
Crops, Rotation of	130
Crops, Subsidiary for Cane Farmers	95
Crystallising Fruit	68
Cultivation of the Peanut	285
Cultivation of the Potato	278
Cultivation, Marvels of	105
Cure for Blight in Cattle	204
Cure for Broodiness in Hens	185
Cure for Tick Poison	105
Cure for Warts in Poultry	168
Curing Bacon and Hams	141
Cutworms	99

D.

Daily Feeding Ration for Milch Cows ...	293
Dairy Produce Acts 1904 to 1905 ...	63
Dairy Breed, The Hereford Cow as a ...	10
Dairy Bull, Choosing a ...	140
Dairy Herd, Queensland Agricultural College ...	10, 68, 140, 180, 234, 293
Dairying ...	10, 62, 140, 180, 234, 293
Darling Pea ...	47
Darnel or Drake ...	4
Dehorning Cows ...	296
Demand for Sisal Fibre ...	164
Demonstration Farms in the United States ...	30
Destroying Caterpillars ...	299
Destruction of Grasshoppers ...	276
Destruction of Prickly Pear ...	264
Destruction of the Pumpkin Beetle ...	39
Dingo-trapping ...	202
Disc-harrowing Lucerne ...	179
Diseases of Poultry ...	145
Distribution of Improved Seed Wheat ...	219
Ditch Millet ...	268
Double-headed Wheat, A New ...	139
Dogs, Fractured Bones in ...	320
Do Hens get too fat to Lay? ...	240
Dried Blood for Laying Hens ...	324
Dry Farming in New South Wales ...	4

E.

Endurance of Ponies	...	...	186
Enoggera Sales	...	50, 113, 170,	
		207, 270,	328
Enormous Grapevine	...	...	186

	Page.
Ensilage, Analyses of	195
Entomology	39
Erection of Piggeries, Specifications for	234
Eri Silk	86
Erosion of Hill Lands	292
Exhausted Soils	177
Experiments with Rubber Seeds	98
Experiments with Winter Cereals at the Roma State Farm	117
Export, Grapes for	79
Export of Butter	12
Export of Fruit from South Africa	19
Extermination of Sparrows	41
Extraction of Oil from Seeds	262

## F.

Facts and Fancies of the Garden ...	...	...	249
Failure of a Potato Crop ...	...	...	111
Farm and Garden Notes ...	51, 114, 172,	210, 273,	329
Farm Crops as Food for Stock ...	...	...	126
Farm Produce, Prices of in the Brisbane Markets ...	50, 113, 170, 207, 270,	328	
Farmers' Boys, An American's Address to ...	...	...	134
Farmers, Notes for, on the Fibre Industry ...	...	...	315
Farming, Dry, in New South Wales ...	...	...	4
Farms, State Poultry, in New Zealand ...	...	...	15
Farms, Demonstration, in the United States ...	...	...	30
Farmyard Manure ...	...	...	132
Fattening Young Fowls ...	...	...	240
Feed and Richness of Milk ...	...	...	184
Feeding Rations daily, for Cows ...	...	...	293
Fences, Wire ...	...	...	167
Fertilisers, Analyses of ...	...	...	260
Fertilisers for Maize, Cost of ...	...	...	325
Fertilising Small Gardens ...	...	...	201
Fibre-extracting Machine, A New ...	...	...	263
Fibre Industry, Notes for Farmers on the ...	...	...	315
Fibre Plant, A New ...	...	...	201
Fibres, The Market for ...	...	...	84
Fighting the Codlin Moth ...	...	...	151
First Sheep in Australia ...	...	...	166
Flax Industry ...	...	...	322
Flax Mills in New Zealand ...	...	...	153
Flora of Queensland and New Guinea, Contributions to the ...	28, 147, 187,	316	
Florida, Pineapple-growing in ...	...	...	16
Flower-gardening ...	20, 88, 154, 188, 244,	301	
Flower-gardening Calendar ...	...	...	24
Forests and Moisture ...	...	...	256
Forestry ...	...	71,	255
Forests of China ...	...	...	255
Forests of Japan ...	...	...	71
Fowls, Laying, Oats for ...	...	...	324
Fowls, Sweet Potatoes for ...	...	...	324
Fractured Bones of Dogs ...	...	...	320
Frozen Pigs from China ...	...	...	205
Fruit Cases ...	...	...	83
Fruit, Export of, from South Africa ...	...	...	19
Fruit Fly, Beating the ...	...	...	83
Fruit, Sulphur Fumes for Preserving ...	...	...	151
Fruits, To Crystallise ...	...	...	68
Fruit, How to Pulp ...	...	...	242
Fruit Market, The Southern ...	49, 112, 169,	206, 269,	327
Fruit, Prices for in the Turbot Street Markets ...	49, 112, 169, 206, 269,	327	

## G.

Gall, Nematode Root	...	...	100
Garden, Destroying Mice in the	...	...	323
Gardens, Fertilising Small	...	...	201



	Page.
Gardening Calendar ... ..	24
Garlic for Tick Fever ... ..	104
General Notes ... 41, 105, 166, 202, 265,	320
German E. Africa, Sisal Hemp in ...	94
"Glenthorne Monarch" ... ..	71
Glass, To Bore a Hole Through ...	109
Goats, Angora ... ..	65
Grading Butter, The Value of ...	295
Grain in Bin and Granary, Insects	
Destructive to ... ..	39
Grapes for Export ... ..	79
Grapevine, An Enormous ... ..	186
Grasshopper Destruction in South Africa	276
Grasshopper in Queensland ... ..	278
Gripes in Horses ... ..	300

## H.

Hemp, Manila, Machine for Extracting	313
Hemp, Sisal in German East Africa ...	94
Hens, Do they get too fat to Lay? ...	240
Hens, Laying, Dried Blood for ...	324
Hens, Laying, Oats for ... ..	324
Hens, Old, for the Table ... ..	14, 77
Hereford Cow as a Dairy Breed ...	10
"Hermitage" State Farm, Crops at the	60
"Hermitage" State Farm, Merino Sheep	
at the ... ..	4
High Prices for Ostriches ... ..	15
Honey, Australian in England ... ..	85
Honey Paste for Labels ... ..	185
Honey, Prospects of an Export Trade in	152
Honey, Some Uses for ... ..	153
Horses ... ..	69, 143, 238, 300
Horses, Broken Bones of ... ..	143
Horses, Care of ... ..	238
Horses, Clipping ... ..	69
Horses not Lying down ... ..	69
Horses, Gripes in ... ..	300
Horses, Ringworm in ... ..	267, 300
Horses, Sweet Potato Vines for ...	300
Horticulture ... 20, 88, 154, 188, 244,	301
Hot Bearing ... ..	108
Hoven or Blown ... ..	103
How to Pulp Fruit ... ..	342
How to Treat a Rusty Tank ... ..	267
How to Vanquish the Mosquito ... ..	43

## I.

Improved Seed-wheat, Distribution of ...	219
In-breeding (Poultry) ... ..	77
Industries, Tropical ... 31, 94, 164, 196, 262,	310
Insects, Boring ... ..	109
Insects Destructive to Grain in Bin and	
Granary ... ..	39

## J.

Japan, The Forests of ... ..	71
Judging Corn ... ..	226
Judging Wheat, Rules for ... ..	229
Judging Stock, Practical Instruction in	135
June, Farm and Garden Notes for ...	273
June, Orchard Notes for ... ..	271

## K.

Kapok ... ..	97, 109
--------------	---------

## L.

Labels, Honey Paste for ... ..	185
Land Erosion ... ..	292
Laying Hens, Dried Blood for ...	324

Laying Hens, Oats for ... ..	324
Lettuce Running to Seed ... ..	134
Local Shows, The Value of ... ..	5
Lucerne, Disc-harrowing of ... ..	179
Lucerne-growing ... ..	55

## M.

Machine, A New Fibre-extracting	263, 313
Maize, Cost of Fertilisers for ... ..	325
Maize Culture ... ..	220
Mango, A New ... ..	84
Manure, Farmyard ... ..	132
Manuring for Milk ... ..	180
March, Farm and Garden Notes for ...	114
March, Orchard Notes for ... ..	115
Margerine, Banana ... ..	322
Market for Fibres ... ..	84
Marketing Poultry ... ..	72
Markets ... 49, 112, 169, 206, 269,	327
Marvels of Cultivation ... ..	105
May, Farm and Garden Notes for ...	210
May, Orchard Notes for ... ..	208
Mead ... ..	153
Merino Sheep at the "Hermitage State	
Farm ... ..	4
Method of Estimating the Yield of	
Cotton in the Field ... ..	229
Mexico, the Pulque Maguey of ... ..	31
Mice in the Garden, To Destroy ...	323
Mildew, Onion ... ..	59
Milk, Manuring for ... ..	180
Milk, Richness of, and Feed ... ..	184
Millet, Ditch ... ..	268
Molasses, Spear and Blue Grass, Analy-	
ses of ... ..	268
Mosquito, How to Vanquish the ...	43
Moths, Trapping ... ..	243
Mouse-trap, A Novel ... ..	102, 323

## N.

National Association, A Proposed	
Chamber of Agricultural Societies ...	9
Nematode Root Gall ... ..	100
New Bordeaux Mixture ... ..	83
New Casein Test ... ..	142
New Fibre-extracting Machine ... ..	263
New Fibre Plant ... ..	201
New Guinea, British, as a Planting	
Country ... ..	32, 33
New Guinea, Contributions to the Flora	
of ... ..	147
New Mango ... ..	84
New South Wales, Dry Farming in ...	4
New Valuable Clover Plant ... ..	126, 139
New Zealand Flax Mills ... ..	153
New Zealand, State Poultry Farms in ...	15
Normanton, Cotton from ... ..	48
Notes, Bee ... ..	30, 85
Notes, Farm and Garden ... 51, 114, 172, 210,	
273, 329	
Notes for Farmers on the Fibre Industry	315
Notes, General ... 41, 105, 166, 202, 265, 320	
Notes, Orchard ... 52, 115, 171, 208, 271, 330	
Notes, Ostrich ... ..	13
Novel Mouse-trap ... ..	102

## O.

Oats for Laying Hens ... ..	324
Official Year-book of the Commonwealth	326
Oil, Extraction of, from Seeds ... ..	262
Old Hens for the Table ... ..	14, 77
Onion Mildew ... ..	59
Onions, Seed ... ..	184

	Page.
Orchard ... ..	16, 79, 186, 242, 309
Orchard Notes ... ..	52, 115, 171, 208, 271, 330
Orchids ... ..	301, 308
Ostrich Notes ... ..	13
Ostriches, High Prices for ... ..	15

## P.

Parasite of the Codlin Moth ... ..	44
Pathology, Animal ... ..	103
Pathology, Vegetable ... ..	100
Peanut Cultivation ... ..	285
Pea, The Darling ... ..	47
Pea, The Spider ... ..	237
Pear Tree, A Fine ... ..	309
Pessou Cane Harvester ... ..	99
<i>Phalaris commutata</i> , Analysis of ... ..	228
Picking Cotton ... ..	94
Pigs, Worms in ... ..	165
Piggeries, Specification for ... ..	234
Pineapple-growing in Florida ... ..	16
Planting Cocoanuts in Samoa ... ..	37
Planting in New Guinea ... ..	32, 33
Planting Seasons in Different Parts of the State of Queensland ... ..	212
Planting Seasons in the Northern Districts (Tropical Products) ... ..	216
Plants in Bedrooms ... ..	44
Poincianas and Acacias ... ..	267
Poison, Tick, Cure for ... ..	105
Poisoning, Sorghum ... ..	55
Poisons, Rat ... ..	107
Ponies, Endurance of ... ..	186
Pork-producing Ration ... ..	142
Potato, Cultivation of the ... ..	278
Poultry ... ..	13, 72, 145, 185, 240, 298
Poultry, Buying ... ..	299
Poultry, Cure for Warts in ... ..	168
Poultry, Diseases of ... ..	145
Poultry Farms, State, in New Zealand ... ..	15
Poultry, Marketing ... ..	72
Poultry, Preparing for Show ... ..	298
Poultry-yard, Common Sense in the ... ..	74
Poultry, Sweet Potatoes for ... ..	324
Practical Instruction in Judging Stock ... ..	135
Preparing Poultry for Show ... ..	298
Preventing Waste of Silage ... ..	135
Prices for Fruit at the Turbot-street Markets ... ..	49, 112, 169, 206, 269, 327
Prices of Farm Produce in the Brisbane Markets ... ..	50, 113, 170, 207, 270, 328
Prickly Pear, Destruction of ... ..	264
Prolific Wheat ... ..	125
Pulping Fruit ... ..	242
"Pulque" Maguey of Mexico ... ..	31
Pumpkin Beetle, Coal Tar for ... ..	166
Pumpkin Beetle, Destruction of the ... ..	39

## Q.

Quantity of Seed Potatoes Required to Plant One Acre of Land ... ..	179
Quantity of Water Available in a Stream, To Measure the ... ..	43
Queensland Agricultural College Dairy Herd ... ..	10, 68, 140, 180, 234, 293
"Queensland Agricultural Journal" ... ..	325
Queensland, Apricot-growing in ... ..	19
Queensland, Arrowroot-growing in ... ..	1, 59
Queensland, Contributions to the Flora of ... ..	28, 147, 187
Queensland National Agricultural and Industrial Association ... ..	9
Queensland, Rainfall of ... ..	29, 87, 144, 194, 241, 309
Queensland, The Grasshopper in ... ..	278

## R.

Rainfall in the Agricultural Districts ... ..	29, 87, 144, 194, 241, 309
Rat Poisons ... ..	107
Rations, Daily, for Cows ... ..	293
Regulations under the Dairy Acts 1904 to 1905 ... ..	63
Ringbarking ... ..	324
Ringworm on Horses ... ..	267, 300
Rise in Wheat and its Justification ... ..	275
Re-inforced Concrete ... ..	106
Roma State Farm, Wheats at the ... ..	7
Roma State Farm, Report on Silage Crops ... ..	175
Roma State Farm, Silage at the ... ..	8
Rotation of Crops ... ..	130
Rough Analysis of Soils ... ..	324
Rubber Seeds, Experiments with ... ..	98
Rules for Judging Wheat ... ..	229
Rusty Tank, How to Treat a ... ..	267

## S.

Sales, Enoggera ... ..	50, 113, 170, 207, 270, 328
Science ... ..	195
Samoa, Coconut-planting in ... ..	37
Seed Onions ... ..	184
Seed Potatoes, Quantity Required to Plant One Acre ... ..	179
Seed Wheat, Improved ... ..	219
Sericulture—Eri Silk ... ..	86
<i>Setaria italica</i> ... ..	267
Seventy-five Bushel Wheat Crop ... ..	4
She-oak and Ti-tree, Derivation of ... ..	324
Sheep, Merino, at the "Hermitage" State Farm ... ..	4
Sheep, Teeswater ... ..	59
Shows, Local, The Value of ... ..	5
Siberia ... ..	165
Silage at the "Hermitage," and Roma State Farms ... ..	8, 175
Silage, Preventing Waste of ... ..	135
Sisal Fibre, Demand for ... ..	164
Sisal Hemp in German East Africa ... ..	94
Soap Waste, Cement from ... ..	93
Soils, Ascertaining the Composition of ... ..	177
Soils, Exhausted ... ..	152
Some Uses for Honey ... ..	55
Sorghum Poisoning ... ..	143
Sound Stallions ... ..	19
South Africa, Export of Fruit from ... ..	49, 112, 169, 206, 269, 327
Southern Fruit Market ... ..	42
Sparrow-destroying Bird ... ..	41, 265
Sparrows, Extermination of ... ..	234
Specifications for Piggeries ... ..	237
Spider Pea ... ..	130
State Farm, Biggenden ... ..	117, 175
State Farm, Roma ... ..	15
State Poultry Farms in New Zealand ... ..	146
Station, A Large ... ..	29, 87, 144, 194, 241, 309
Statistics ... ..	135
Stock, Practical Instruction in Judging ... ..	12
Story of Two Cows ... ..	297
Straw Butter Boxes ... ..	267
Strawberry, Creation of a New ... ..	321
Stumps, Burning Out ... ..	239
"Sugar Journal, The Australian" ... ..	95
Subsidiary Crops for Cane Farmers ... ..	110
Sugar-cane, Chopped, as Fodder ... ..	151
Sulphur Fumes for Preserving Fruit ... ..	36, 108, 163, 193, 259, 331
Sunrise and Sunset at Brisbane ... ..	107
Sweet Potato Weevil ... ..	324
Sweet Potato Vines for Horses ... ..	324
Sweet Potatoes for Fowls ... ..	324



## vii.

T.	Page.
Tank, An Underground ... ..	109
Tank, How to Treat a Rusty ... ..	267
Teeswater Sheep ... ..	59
The Candle-nut Tree ... ..	37
The Darling Pea ... ..	47
The First Sheep in Australia ... ..	166
The Hereford Cow as a Dairy Breed ... ..	10
The Pulque Maguey of Mexico ... ..	31
The Spider Pea ... ..	237
The Tuberculin Test ... ..	62
The Value of Local Shows ... ..	5
Tick Fever, Garlic for ... ..	104
Tick Poison, Cure for ... ..	105
Times of Sunrise and Sunset at Brisbane ... ..	38,
... .. 108, 163, 193, 259,	331
To Destroy Mice in the Garden ... ..	323
To Fatten Young Fowls ... ..	240
To Find the Composition of Soils ... ..	324
To Measure the Quantity of Water Available in a Stream ... ..	46
To Tell When Watermelons are Ripe ... ..	324
Tomato Beetles ... ..	205
Trapping Moths ... ..	243
Tropical Clover ... ..	268
Tropical Industries ... ..	31, 94, 164, 196, 262, 310
Two Cows, A Story of ... ..	12
Tympanites, Acute (Hoven) ... ..	103
U.	
Underground Tank ... ..	109
Uses for Honey ... ..	152

V.	Page.
Value of Grading Butter ... ..	295
Value of Local Shows ... ..	5
W.	
Washington Whitewash ... ..	292
Watermelons, To Tell When Ripe ... ..	324
Water-weed Cutter ... ..	45
Weevil, The Sweet Potato ... ..	107
What not Advertising Cost Him ... ..	166
What a Good Milch Cow should Yield ... ..	322
Wheat, A Prolific ... ..	125
Wheat Crop, A Seventy-five Bushel ... ..	4
Wheat, A New Double-eared ... ..	139
Wheat-growing on Coast Lands ... ..	176
Wheat, An Improved Seed ... ..	219
Wheat, The Rise in, and its Justification ... ..	275
Wheats at the State Farm, "Hermitage" ... ..	60
Wheats at the State Farm, Roma ... ..	7, 152
Windmills ... ..	202
Winter Asparagus ... ..	233
Wire Fences ... ..	167
Worms in Pigs ... ..	165
Y.	
Year-book, Official, of the Commonwealth for 1901 to 1908, Nos. 1 and 2 ... ..	326





VOL. XXII., PART 1.

[JAN., 1909.]

Registered at the General Post Office for Transmission by Post as a Newspaper.

---



THE  
QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE.

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOL. XXII. PART 1.

---

JANUARY.

---

By Authority:

BRISBANE: ANTHONY J. CUMMING, ACTING GOVERNMENT PRINTER.

1909.

## CONTENTS.

AGRICULTURE—								PAGE.
Arrowroot-growing in Queensland	...	...	...	...	...	...	...	1
Merino Sheep at Hermitage State Farm	...	...	...	...	...	...	...	4
A Seventy-five Bushel Wheat Crop	...	...	...	...	...	...	...	4
Dry Farming in New South Wales	...	...	...	...	...	...	...	4
Darnel or Drake	...	...	...	...	...	...	...	4
The Value of Local Shows	...	...	...	...	...	...	...	5
Wheat at the State Farm, Roma	...	...	...	...	...	...	...	7
Silage at the Hermitage and Roma State Farms	...	...	...	...	...	...	...	8
National Agricultural and Industrial Association of Queensland	...	...	...	...	...	...	...	9
DAIRYING—								
The Dairy Herd—Queensland Agricultural College, Gatton	...	...	...	...	...	...	...	10
The Hereford Cow as a Dairy Breed	...	...	...	...	...	...	...	10
A Story of Two Cows	...	...	...	...	...	...	...	12
Export of Butter	...	...	...	...	...	...	...	12
POULTRY—								
Ostrich Notes	...	...	...	...	...	...	...	13
Old Hens for the Table	...	...	...	...	...	...	...	14
High Prices for Ostriches	...	...	...	...	...	...	...	15
State Poultry Farms in New Zealand	...	...	...	...	...	...	...	15
THE ORCHARD—								
Pineapple-growing in Florida	...	...	...	...	H. H. Hume	...	...	16
Apricot-growing in Queensland	...	...	...	...	...	...	...	19
Export of Fruit from South Africa	...	...	...	...	...	...	...	19
HORTICULTURE—								
Flower Gardening, No. 12	...	...	...	...	The Editor	...	...	20
Flower Garden Calendar	...	...	...	...	...	...	...	24
BOTANY—								
Contributions to the Flora of Queensland	...	...	...	...	F. M. Bailey, F.L.S.	...	...	28
STATISTICS—								
Rainfall of Queensland	...	...	...	...	...	...	...	29
APICULTURE—								
Bee Notes	...	...	...	...	...	...	...	30
DEMONSTRATION FARMS IN THE UNITED STATES								30

**TROPICAL INDUSTRIES—**

PAGE.

The "Pulque Maguey" of Mexico	...	...	...	...	...	31
British New Guinea as a Planting Country	...	...	...	...	...	32
Planting in New Guinea	...	...	Wallace R. Westland	...	...	33
Cocoa-nut Planting in Samoa	...	...	...	...	...	37
The Candle-nut Tree	...	...	...	...	...	37

TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1909	...	...	...	...	38
-----------------------------------------------	-----	-----	-----	-----	----

**ENTOMOLOGY—**

Destruction of the Pumpkin Beetle	...	...	...	...	...	39
Insects Destructive to Grain in Bin and Granary	...	...	...	...	...	39

**GENERAL NOTES—**

Another Drought Predicted	...	...	...	...	...	41
Extermination of Sparrows	...	...	...	...	...	41
Sparrow-destroying Bird	...	...	...	...	...	42
How to Vanquish the Mosquito	...	...	...	...	...	43
Plants in Bedrooms	...	...	...	...	...	44
A Codlin Moth Parasite	...	...	...	...	...	44
A Water-weed Cutter	...	...	...	...	...	45

**ANSWERS TO CORRESPONDENTS—**

To Measure the Quantity of Water available in a Stream	...	...	...	...	...	46
The Darling Pea	...	...	...	...	...	47
Cassava as Foodstuff	...	...	...	...	...	47
Cotton from Normanton	...	...	...	...	...	48

**THE MARKETS—**

Prices for Fruit—Roma-street Markets	...	...	...	...	...	49
Southern Fruit Market	...	...	...	...	...	49
Prices of Farm Produce in the Brisbane Markets for December	...	...	...	...	...	50

FARM AND GARDEN NOTES FOR FEBRUARY	...	...	...	...	51
------------------------------------	-----	-----	-----	-----	----

ORCHARD NOTES FOR FEBRUARY	...	...	A. H. Benson, M.R.A.C.	...	52
----------------------------	-----	-----	------------------------	-----	----

LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES	...	...	...	...	I.
--------------------------------------------------	-----	-----	-----	-----	----

DEPARTMENTAL ANNOUNCEMENTS	...	...	...	...	...	VI.
----------------------------	-----	-----	-----	-----	-----	-----

DIRECTIONS FOR FORWARDING SPECIMENS	...	...	...	...	...	VII.
-------------------------------------	-----	-----	-----	-----	-----	------



NOTICE.

Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,  
to cover postage.

To all other persons the annual subscription will be 10s., which will include postage.

All remittances should be made by postal notes or money orders, but where they are unobtainable stamps will be accepted, though the Department accepts no responsibility for any loss due to the latter mode of remitting.

For your convenience an Order Form is attached. A cross on each side of the Order Form indicates to the recipient that his subscription is announced.

Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

ORDER FORM.

To the Under Secretary, Department of Agriculture  
and Stock, Brisbane.

For the enclosed\* ..... please  
forward me THE QUEENSLAND AGRICULTURAL  
JOURNAL for One Year.

Name.....

PLEASE Address.....

WRITE .....

PLAINLY. ....

Occupation.....

\* State amount according to above rate.

## Agriculture.

### ARROWROOT-GROWING IN QUEENSLAND.

The cultivation of arrowroot in this State dates back to 1864. It was then grown at Oxley Creek by Major A. J. Boyd, who manufactured the commercial article by the primitive process of grating the bulbs and purifying the starch by straining it several times through linen stretched over tubs. The product was then readily sold at 1s. per lb. Later on Mr. Boyd sold the bulbs to Mr. Grimes, who also grew arrowroot at Oxley and on the Brisbane River, where he erected the first arrowroot mill installed in the State. The bulbs were sold at £2 10s. per ton; and on the then virgin scrub soils between Oxley Creek and Rocklea, or Rocky Water Holes as the place was then called, the return was enormous. Mr. Grimes grew both the *Maranta* and the *Canna edulis*, but the former, owing to the small production of bulbs, was found not to be profitable.

At the present day all the arrowroot manufactured in Queensland is produced in the Albert, Pimpama, and Nerang districts. At Pimpama the Messrs. Lahey had extensive plantations and a well-equipped manufactory. Ormeau, where a considerable quantity of arrowroot is grown, was taken up under the old "Sugar and Coffee Regulations," by Major Boyd, who erected a sugar mill and grew cane for several years. He named his plantation "Ormeau," hence the name of the railway station on the South Coast line. A very interesting account of the arrowroot industry, by H. N. L.—presumably Mr. Leahy—appeared in the "Brisbane Courier" of 17th October last, and we reproduce it as showing the rise and progress of the industry since its initiation:—

#### GROWERS AND PRICES.

At present the growers are all situated about Yatala, Pimpama, Ormeau, and Nerang, and the principal ones are Messrs. J. Latimer and Sons, Doherty Bros., R. Doherty, Mayes, W. Murtha, Mills, J. Buli, and Mrs. Clarke. The total area under cultivation is about 200 acres, and Messrs. Doherty Bros. and R. Doherty are the largest growers, having between them about 100 acres, while Messrs. Latimer Bros., at Nerang, have 35 acres. The other growers cultivate 10 to 15 acres each of this product. The yield of the marketable product ranges from 15 to 30 cwt. per acre, and the total production is about 600,000 lb., or just the same as was estimated by Mr. Samuel Grimes, in an article written by him on arrowroot cultivation in 1888.

The price to the grower varies considerably. Two years ago it brought about £10 a ton, but this year the demand has increased, and fully £20 a ton has been obtained. The demand has been largely stimulated by the spread of the knowledge that arrowroot is quite equal to starch for most kinds of laundry work, while even at present prices it is only half the cost. As its value as starch becomes more widely known, there is little doubt that a market will be developed for a largely increased supply. Taking the figures for last year, we find that 1,284,815 lb. of starch, valued at £17,375, was imported into Queensland, mostly from Victoria, and much of this could no doubt be replaced by the cheaper and equally effective arrowroot for all classes of laundry work, except cold starching—that is, in the case of such articles as shirt fronts or collars. Although its use as a starch is by no means new, the knowledge of it has in the past been limited, and it is only recently that it has come into popular vogue. For years past arrowroot has been utilised chiefly for culinary purposes, such as the manufacture of superior quality biscuits, light cakes, and easily digested foods for invalids.



## MARANTA AND CANNA.

The Queensland arrowroot is really the starch product of a bulb of the Canna tribe of plants—namely, *Canna edulis*. This is mentioned particularly because it differs from Bermuda arrowroot, and cannot be sold in Great Britain as arrowroot without some qualifying term attached, such as “Queensland arrowroot” or “Australian arrowroot.” How this has come about is rather interesting. When the Drugs and Food Act was passed by the Imperial Parliament it was specified that arrowroot is the product of the plant *Maranta arundinaceæ*. That is what Bermuda and Mauritius arrowroots are made from; and manufactured arrowroot from the *Canna edulis* was then practically unknown in Great Britain. How little actual difference there is between the two is indicated by the following analysis, taking the best Bermuda arrowroot (*Maranta arundinaceæ*) at 2s. 6d. per lb., and the Queensland arrowroot (*Canna edulis*) at 2d. or 3d. per lb.:—

				Bermuda Arrowroot.	Queensland Arrowroot.
Moisture	...	...	...	13·00 to 16·50	17·36
Starch	...	...	...	82·24	81·52
Ash	...	...	...	·124	·142
Proteids	...	...	...	·052	·078
Fibre	...	...	...	4·09 to 1·20	·90

The result is, therefore, chemically about the same, particularly in regard to starch, which is the chief constituent. There is a little more moisture in the Canna, and more fibre in the Maranta. Under the microscope the Canna arrowroot shows a more silky texture, and the grains are slightly coarser.

The *Maranta arundinaceæ* grows equally well in Queensland with the *Canna edulis*, and arrowroot-growers have at various times cultivated it. It has been known as white arrowroot (from the colour of the bulbs), while the present article is called purple arrowroot. The reason that Maranta has never become popular here is that it yields only half the quantity of arrowroot given by the Canna, and the growers could get no more for the product; and also because the excess of fibre in the Maranta made the matter of treatment more difficult.

## METHODS OF CULTIVATION.

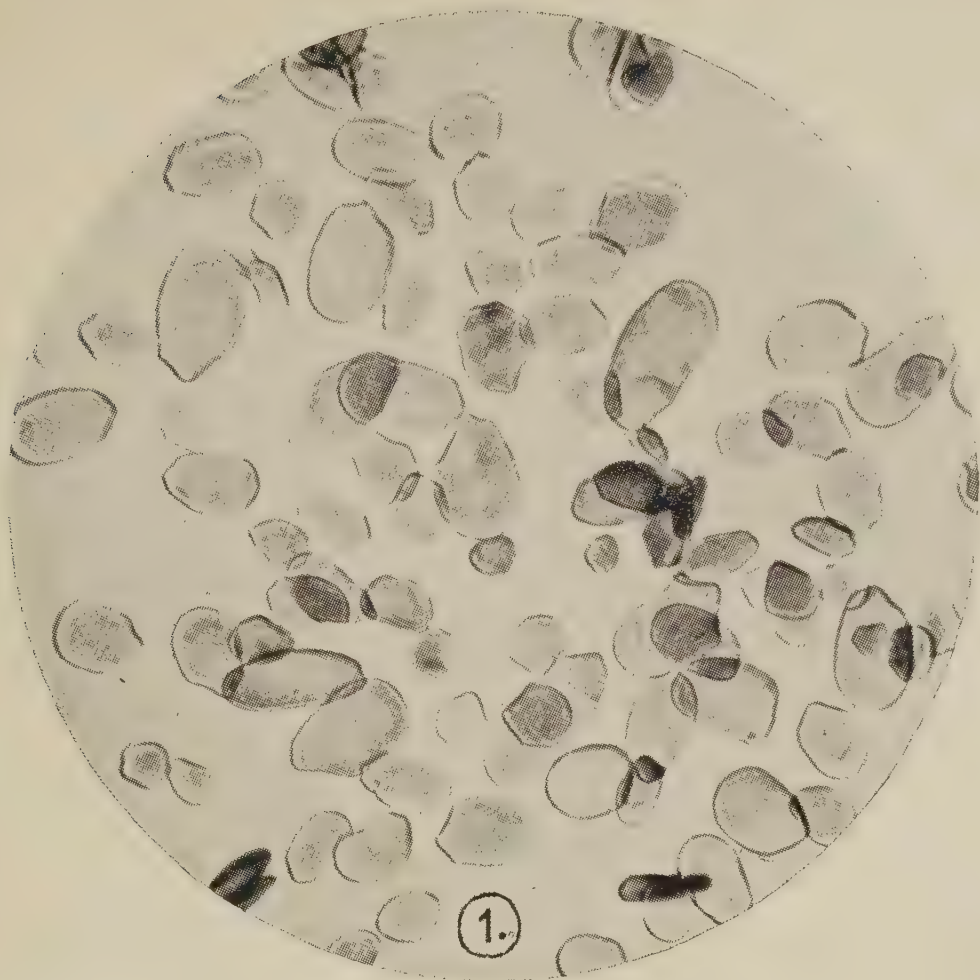
A visit to some of the arrowroot farms has just been made to ascertain how the industry is progressing, and how it is being conducted. There is a similarity among them all. The rich alluvial pockets along the banks of creeks are the growing grounds. A manufacturing plant, comprising boiler, engine, pumping, pulping, and straining machinery, is required, which costs about £500. Then there has to be a drying ground, with the requisite frames, and a shed for storage and packing purposes.

The bulbs of the Canna are sown in prepared ground from September to December, when the weather is showery, the rows being 6 ft. apart and 4 ft. between the plants. The usual cultivation follows to keep the ground clear of weeds until the plants get too big. A field of Canna presents a pretty sight, the broad leaves of dark-green giving a fine impression of richness, and sometimes also scarlet flowers are to be seen on the plants. From six to eight months brings the crop to maturity, and a little frost is then beneficial by shrivelling up the tops and concentrating the starch in the bulbs. The tops are cut off by means of a cane knife or bill hook, and the bulbs—something like potatoes, but larger—are then dug as required for milling.

## PROCESS OF MANUFACTURE.

The bulbs are carted to the mill and shovelled into a root-washer—a trough 10 ft. or 12 ft. long, through which water is continuously flowing, and in which a spindle revolves and works the bulbs up to the end of the trough. There an elevator receives them and carries them up to the mill. There they are grated in a grinder, or perforated wooden drum, revolving at





STARCHES MAGNIFIED 250 DIAMETERS.

1. West India Arrowroot (*Maranta arundinacea*).
2. Tous-les-mois (*Canna edulis*), Queensland Arrowroot.





great speed, and the pulp passed through to a sieve of perforated metal, clean water all the time falling on the pulp. A beater forces the farina and water through the sieve, while the fibre is discharged on to a dump. The farina from the sieve goes into a revolving copper drum, which has also perforated sides, and this takes away some more of the impurities, while the farina goes down into a long trough, through which a stream of water is constantly running. The arrowroot settles at the bottom of the trough, and after some hours of washing is dug out and put into tubs, or other troughs, and more clean water with it. That is repeated three times, the farina during the last having to pass through a sieve of fine muslin. After that the arrowroot is dug out, placed on calico sheets, and put out on frames to dry. The whole process, from the digging of the bulbs to the drying of the prepared arrowroot, occupies about twenty-four hours.

It will easily be seen that it is of little use trying to manufacture arrowroot unless there is a plentiful supply of good clean water. Mr. J. Latimer, who had 8 acres under arrowroot at Yatala this year, was working his mill two or three days a week, and producing about half a ton of arrowroot a day. To do this, he estimated that 24,000 gallons of water were used in eight hours.

The refuse, fibre, and pulp are carted back to the fields for use as manure.

After drying, the arrowroot is ready for bagging, and it is put in sacks lined with calico ready for market. Most of the arrowroot is brought to Brisbane by steamers on account of the cheaper freights. By railway from Stapylton to South Brisbane (24 miles) the freight is 8s. per ton, and 2s. 6d. more has to be paid for cartage to business places in the city—a total of 10s. 6d. per ton if by rail. By steamer from Yatala the freight is 5s. per ton and 1s. 6d. a ton cartage from the wharf to the stores—total, 6s. 6d. By train the cost from Nerang is 12s., and by steamer 8s.; so that the advantage of water carriage will easily be recognised in the case of products which leave only a small margin of profit.

Mr. T. Doherty, one of the principal growers, remarked that arrowroot gave about the same return as corn or potatoes, but it was a surer crop. It would stand flooding that would kill potatoes, and dry weather would not affect it so adversely as it would corn.

At the Melbourne Exhibition, W. Murtha received the gold medal for arrowroot, and J. Latimer the silver medal; and at Earl's Court Exhibition (London), in 1899, Messrs. J. Latimer and Sons received a silver medal and diploma for their exhibit of arrowroot.

#### EARLY HISTORY OF ARROWROOT.

The name of Mr. Samuel Grimes has long been connected with arrowroot manufacture, and he assisted it along very materially in years past. At the present time, Mr. J. Latimer is probably the grower who has been longest in the business. He related how in 1868 he went to Messrs. R. and G. Board's plantation, Malungmavel, to erect some machinery for the sugar-making, and also to put up an arrowroot manufacturing plant of a primitive type. Messrs. Board had 10 acres under arrowroot, and they then got £40 per ton for it. At that time Mr. Grimes was also growing some. In those days the whole of the product went to Melbourne. As sugar was then paying very well, Messrs. Board relinquished arrowroot-growing, but Messrs. Grimes and Lahey continued with it, and soon afterwards some small growers began to raise the bulb. Since then it has continued to be a small farmer's crop, largely on account of labour conditions making it unremunerative to pay much outside the grower's family. The 200 acres grown this year will probably produce 250 tons of marketable arrowroot, worth approximately £5,000. There are areas of suitable land with good water available in the district to widely extend the industry should the demand justify it, and no doubt the day will come when much of the starch used in Australia is manufactured in the same district, from arrowroot, potatoes, maize, and other products which flourish so well there.



### MERINO SHEEP AT HERMITAGE STATE FARM.

A report has been received by the Under Secretary for Agriculture and Stock from the manager of the Hermitage State Farm, near Warwick, in which details have been furnished of the amount of wool shorn from the respective classes of stud sheep on the farm at the end of October last.

The young sheep bred on the farm are from pure Glengallan merino ewes, which were presented to the Department by Mr. W. B. Slade, the owner of Glengallan, and are the progeny of rams also bred at Glengallan.

Mr. Slade had the wool of the latter sheep scoured at the Brisbane Technical College, with the resulting weight of 9.93 lb. of absolutely clean wool in a fit state for manufacture.

Stud breeding ewes cut up to 13 lb. of wool at this shearing, and averaged 10 lb. 10 oz. Two-tooth rams, shorn as lambs, cut up to 19½ lb. of wool, and averaged 16 lb.

Two-tooth ewes, shorn as lambs, cut up to 17 lb. of wool, averaging 13 lb. 7 oz. Summer ram and ewe lambs averaged 11 lb. and 9¼ lb. respectively.

### SEVENTY-FIVE BUSHEL WHEAT CROP.

According to the agricultural statistics of South Australia, that State is never credited with a very high average yield per acre. It, therefore, comes as a pleasant surprise to hear what the possibilities of wheat-growing in the Southern State are. We learn from the "Farmers' Union Advocate," New Zealand, that last year Mr. T. Pengilly, of Aldinga (South Australia), who makes a hobby of experimenting with various kinds of wheat, had a plot of Federation wheat which gave a return of 75 bushels to the acre. The Department of Agriculture were dubious as to the correctness of the return, but on measuring the ground for themselves they made it a rather smaller area than Mr. Pengilly's measurement, thus proving that the 75-bushel return was within the mark.

### DRY FARMING IN NEW SOUTH WALES.

A dairyman and farmer at Narrabri has successfully experimented with the dry farming method, as adopted in some of the Western States of America, and has had the satisfaction of growing some excellent crops of wheat. The attempt was made on black soil, which is generally held to be useless for the raising of cereals. The main point of dry farming is deep ploughing, and an extra amount of working the soil, so that it becomes pulverised and prevents the evaporation of the moisture, which occurs under other conditions. A machine called a packer is also used for pulverising and compressing the sub-soil. These methods were here carried out with the most satisfactory results. After an absence of rain for six weeks, when a knife was plunged into the soil, it was withdrawn with mud sticking to it. It paid the farmer in this case to cut his crop for hay, but had he secured the seed the returns would certainly have been very gratifying.

### DARNEL OR DRAKE.

In a letter addressed to a Rockhampton journal (the "Morning Bulletin") by Mr. Geo. Wilkinson, Lion Creek road, Rockhampton, he draws attention to a dangerous grass which has made its appearance in that district—namely, the Darnel (*Lolium temulentum*). He rightly says that this grass "has had an evil reputation from the dawn of history, and the highest authorities are agreed that the tares of Scripture and *Lolium temulentum* are one and the same." He further quotes the Scripture parable of the tares, but he omits to

state that when the servants of the householder asked if they should go and gather the tares (darnel) up, the latter would not allow this to be done until the harvest, "lest, while ye gather up the tares, ye root up the wheat also with them." Why this? It was because the householder knew that the darnel is so widely rooted that it is impossible to eradicate it by hand unless a knife were passed round each plant, otherwise in rooting it up the wheat will also be taken up with it. The Colonial Botanist, Mr. F. M. Bailey, has supplied the following notes on Mr. Wilkinson's letter:—

"The grass referred to by Mr. Wilkinson is one of the best known by farmers the world over, and its bad character has been handed down from father to son, generation to generation, without the matter having been carefully gone into. I have eaten bread made of flour which was made of grain principally composed of drake seed, because, before winnowing machines were much in use, we had to winnow by the wind, and I never heard of anyone being made ill from such food.

"In one of the quotations from Scripture there is nothing said about the grain—the men were not to pull up the tares at that particular time for fear of destroying the wheat. (This sentence can be easily understood by the strong rooting character of the grass.) In other quotations, as to the grass's poisonous properties, it is probable the ergotty rye is answerable for the ill-effects attributed to this tare, Drake or Darnel. I have known the plant in Australia for the past nearly seventy years."

---

#### THE VALUE OF LOCAL SHOWS.

At the Agricultural Conference held at Warwick, in June, 1900, a very excellent paper, was read by Mr. T. Burgess, of Forest Hill, on "The Functions of Agricultural Societies."

There are those who would belittle the work done in the interests of agriculture and stock-breeding, and sum up their so-called arguments by saying that the only function exercised by the country societies is the holding of an annual show. We do not care to enter into disputation on this opinion, erroneous as we hold it to be. Mr. Burgess, whilst holding that there are too many shows and too much sameness about them ("see one, and you see them all," he said), yet recognised their value to the agricultural community, only asking that they should be rendered more attractive by the introduction of new features into them. Mr. J. Hudson, Rosewood, maintained that those who said that there was not much to be learned from shows, big or little, were not real farmers. If he did not take a prize for a horse he might show, he naturally went to other shows to see where he was wrong. The same thing applied to the cattle and farm produce sections. If a farmer wanted to teach his son anything in connection with agriculture, let him take him round a show, and point out to him the animals and implements which have taken prizes, and indicate the points that are good and those that are bad. The boy would never forget the lesson, and he will have learned something that will be of service to him when he becomes a man. On the value of country shows, Lord Middleton wrote as follows in the "Live Stock Journal" in 1901:—

That the agricultural show system is beneficial, and of value to agriculture in general, is a usually admitted fact, though occasionally I have heard the reverse opinion expressed, with added gloomy forebodings that the heyday of such shows is over.

My own opinion is that agricultural shows are of the greatest value, and at no time more so than the present. It has probably occurred to those who have given the subject unprejudiced attention that the chief value of these competitive exhibitions is threefold—namely, first, the opportunity they give of comparison; secondly, the emulation they excite; third and last (and by no means least), their use as an advertising medium.



We all know the trite old saying that many a man's goose is his swan, and nowhere is this saying brought home to us more vividly than in the showyard. Frequently have I (and doubtless many of my readers have shared this experience) taken the pick of our farm to the showyard, expecting great things; only to have our pride knocked out of us on entering the ring by finding what we hoped might be the winner of the red rosette relegated to a very inferior place. We have gone home sadder and wiser men, with a teaching, however, which will doubtless show excellent result in the future.

If it were not for these showyard gatherings of stock, I do not see how we should be able to compare our own with that of others, nor arrive at the pitch of perfection now reached. There are men who possess it, but it cannot be counted a universal gift, that power of carrying the definite picture of an animal for any time in the mind's eye; to the "general," therefore, what a boon is the showyard, when he can do his comparing studies within small limits of time and space.

In mentioning the perfection to which stock has attained in the present day, I would call attention particularly to the improvement in the Shire horse. It is extraordinary the stride this breed has made in comparatively few years; the champions of twenty years ago would be regarded as moderate horses to-day. There are other breeds which to me seem to have made similar progress of late years; I might mention the Galloways, the Welsh cattle, the Sussex, and, in sheep, conspicuously the Suffolk. Some may say it is the breed societies which have done this. To a certain extent it may be so; the societies, after all, are the parents of the shows.

Having touched lightly on the privileges afforded to owners of stock by the use of comparison, we now come to the emulation which showyards create; and this must be a valuable constituent of their worth, and stimulate the production of high-class stock. The Briton is at all times fond of competition; in whatever pursuits he may be engaged, he profoundly dislikes being beaten. If it had not been for this enterprising spirit we should not have held the place we do in the world as breeders of pedigree stock; we owe it entirely to our individual patience and perseverance. In France, in Germany, in Russia, and other Continental countries, breeders have to be encouraged by State help. Here it is left to private enterprise, and long may it be so, for it makes us self-reliant and dependent on our own long-practised judgment.

Now we come to the advertising medium of showyards, or the opportunity they afford for publishing, so to speak, the best markets for our goods. It is a well-known fact that the temperate climate of the British Isles fits them for being in a large measure the world's nurseries of pedigree stock. We are subject to none of those variations from which many parts of the globe suffer; no extremes of cold, heat, or drought; and therefore we understand why the outlander, impeded or frustrated by failure on account of these extremes, comes to our shores for reinforcement and renewing of blood.

It is, then, to the centralising depôts of our showyards that the foreigner or colonial makes his way, knowing that there he will meet the best products of the district, county, or country; while in the carefully-prepared catalogue he will find a ready reference to the names and addresses of owners and breeders of the particular breeds he seeks.

In speaking of the advertising value of shows, I must not omit to allude to the great assistance afforded by the Press in its periodical reports of these exhibitions, giving lists and descriptions of the prize-winners, and calling attention to even less fortunate exhibits; these reports are distributed to our daily and weekly papers, and thence go out to the world at large.

So far my remarks have been entirely confined to stock, but the agricultural showyard contains many other desirable exhibits; the implement yards alone would repay considerable expenditure of time and attention.

Whether at the Royal, the Highland, or the larger county shows, the would-be purchaser requiring a plough, a harrow, a binder, or engine finds a



large and varied choice, well suited to all sorts of soils and situations; and the plan followed at certain shows of severely testing some of the machinery, and awarding medals and certificates of merit, affords a safe guide in selecting.

The dairy, the shoeing, the beekeepers' and seedsmen's stands, also the poultry demonstrations, are all of practical importance, and all gathered in so concentrated an area that it is possible at least to run through them within the limits of a day's outing, and the man would have indeed a clouded eye and an obtuse mind who was unable to gather fresh ideas, and take some, at any rate, away with him.

In addition to those named are all the smaller exhibits—small, but none the less important to the agriculturist: fences, troughs, gates, pumps, and lesser tools, such as rakes, forks, spades, &c.; all these can be inspected and studied alike by the small crofter, the 1,000-acre occupier, or the large landed proprietor.

Some people cavil at the number of small shows in certain country districts. I myself have been disposed to question whether the number was not excessive, as they seem at times to overlap one another; but, doubtless, this is an ill which rights itself, for those that do not pay will disappear. Our larger shows monopolise so much time and expenditure that it is not everyone who can afford to patronise them, extending as they do from two to eight days. Now, at the little one-day local show the small farmer can start in the morning from home, take his prize, and be back again with his animal the same evening; he is not scared here by what is termed the professional exhibitor, but can meet his like on fair grounds. It brings to the front many a small breeder, and many a good animal, who, in their turn finding their ways thither, act as feeders to the larger shows. Much responsibility, however, rests with the promoters and councils of these local shows in initiating classes and providing adequate prizes for bringing out their district breeds to the best advantage; much lies with them in encouraging the right sort of stock, suited to the requirements of the day, for no doubt we agriculturists must travel with the times. The services of the best judges should be carefully secured, well-known men of practised judgment, who can be depended upon to recognise and pick out the correct stamp. Through these means the local shows will, as I suggested above, act as feeders to the larger ones, and the whole work together in framing our national show system. There is one most important item of agricultural exhibitions which I have left to the last—that is, the thorough inspection of animals by the veterinary surgeons; for if we are to be, as it were, the Stud Farm of the World, it is all-important that one of our first considerations in breeding stock should be the freedom of that stock from hereditary disease. Almost yearly new countries are opened out, our colonies are brought closer to us, the means of communication advances by strides, there will be larger areas for civilisation and cultivation; and, consequently, pure-bred stock will ever be in greater demand. Thus it behoves us to keep up a plentiful supply of the right material, and to encourage and perfect to its fullest scope that show system which plays so important a part in its development.

---

#### WHEATS AT THE STATE FARM, ROMA.

Up till quite recently the quality of grain rather than yield per acre has been characteristic of the Maranoa district, and it is only of recent date, season 1906, that rust has proved, at certain times, a serious menace to the industry. The usual seasons are marked by a dry bracing atmosphere, and a rainfall aggregating 20·30 in. per annum.

It is only a natural consequence that prolific, hardy wheats would be most in favour, and rust-resisting varieties not of much moment.



At the Roma State farm special attention is being given to the evolution of new varieties of wheat by cross fertilisation and the carrying on of varied systems of cultivation, to which the "Campbell" dry-farming system has been added.

Comparative tests of a number of new wheats from England, America, and the Southern States are being made. Some of the returns this year are above normal, up to 37·6 bushels per acre being harvested from small plots grown under field conditions, and the district average promises to be much better than usual.

To make the results of experiment work as widespread as possible, and to give farmers a chance of working up into a more reliable rust-resisting, strong-flour wheat, single bushel lots of seed of Bungie No. 1 were sent out in time for the wheat-planting season of 1908 gratis, with freight paid, to certain farmers throughout the wheat belt, with a proviso that defined rational methods of cultivation should be followed. A preliminary inspection of many of the farmers' plots served to show that the variety is likely to do well under favourable conditions. So far, the only return to hand is from Mr. White, of Blythdale, who harvested 40 bushels from 1 bushel of seed sown on  $1\frac{1}{2}$  acre. A field plot of 5 acres near the State farm has given 35 bags from 5 acres. At the State farm a 4-acre plot gave 26·7 bushels per acre. The variety came out of the rusty year of 1906, with a yield of 17·5 bushels per acre; and in the dry season of 1907, when only 3·75 in. of rain were recorded from seeding time to maturity, it gave a return of  $14\frac{1}{2}$  bushels. The illustration in the present issue will convey an idea as to what perfection the crop reached this year on a light sandy soil with seed sown on 22nd June. A late sowing on 5th August, as a catch crop, gave a return of 20 bushels to the acre. Eight weeks after appearing above ground the wheat was well out in ear; but this, of course, is an exceptional circumstance.

The variety has so far proved itself superior to many others now universally grown, and has shown out conspicuously above a large number of other cross-bred wheats. It is a quick-maturing, rust-resistant, and rust-escaping kind, is a light stooler, and has a slender, tough straw, with a minimum of flag, and is a good wheat to strip. Numerous inquiries have been made for seed for next season's sowing, and many farmers have expressed their intention of seeding down increased areas.

---

#### SILAGE AT HERMITAGE AND ROMA STATE FARMS.

*Hermitage.*—The accompanying illustrations, taken whilst the farm apprentices were at work filling the silo at the latter end of last summer, to provide winter feed for stock, serve to demonstrate the process of cutting, carting, chaffing, and elevation of fodder. An ordinary chaff-cutter has been adopted, and will cut 4 tons an hour if fed to that capacity.

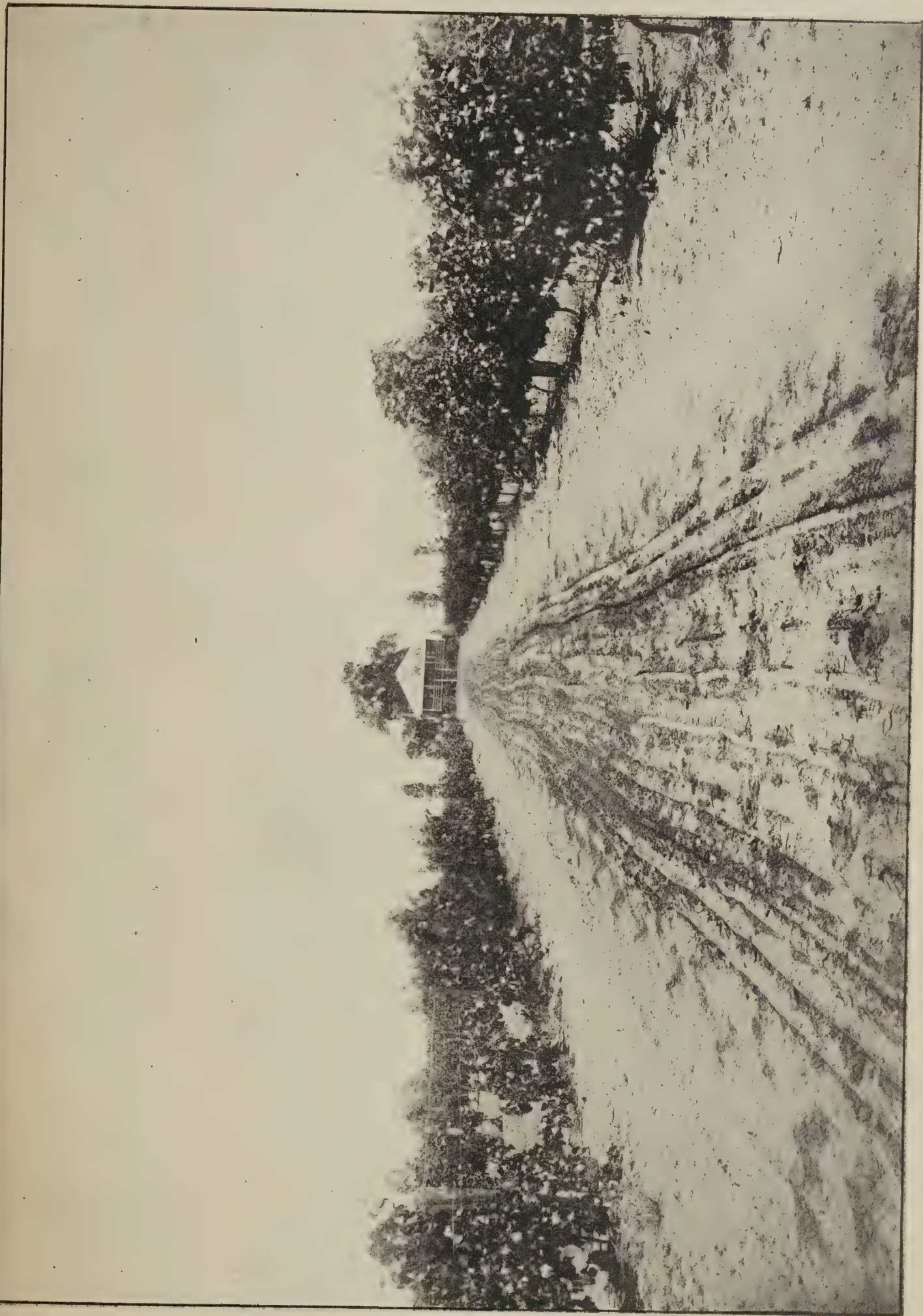
For economic handling of bulky crops, nothing surpasses the corn-binder for tying up conveniently-sized bundles, and facilitating subsequent handling. Lucerne, sorghum, Kafir corn, maize, and massagua, aggregating over 150 tons, were turned into silage last year, and the manager asserts that in the "fibro-cement" silo, after removal of upper crust (which always decays), the subsequent waste did not exceed 1 per cent.

The building is of 120 tons' capacity, octagonal in shape, with hardwood timber frame lined with fibro-cement sheets; this material does not show any signs of deterioration from silage acids, after two seasons' use. Exception may be taken to its thinness ( $\frac{3}{16}$  of an in.), but the makers are adopting a stouter gauge; and, should a cheap and suitable form of re-inforcement be found, its value for lining will be enhanced.

Stock of all descriptions thrive on the silage, and were fed throughout the winter. Even up to early December, use has been found for feeding two



*Plate II.*



THE MANAGER'S RESIDENCE, STATE FARM, ROMA.





*Plate III.*



BUNGIE No. 1 WHEAT AT THE STATE FARM, ROMA.





*Plate IV.*

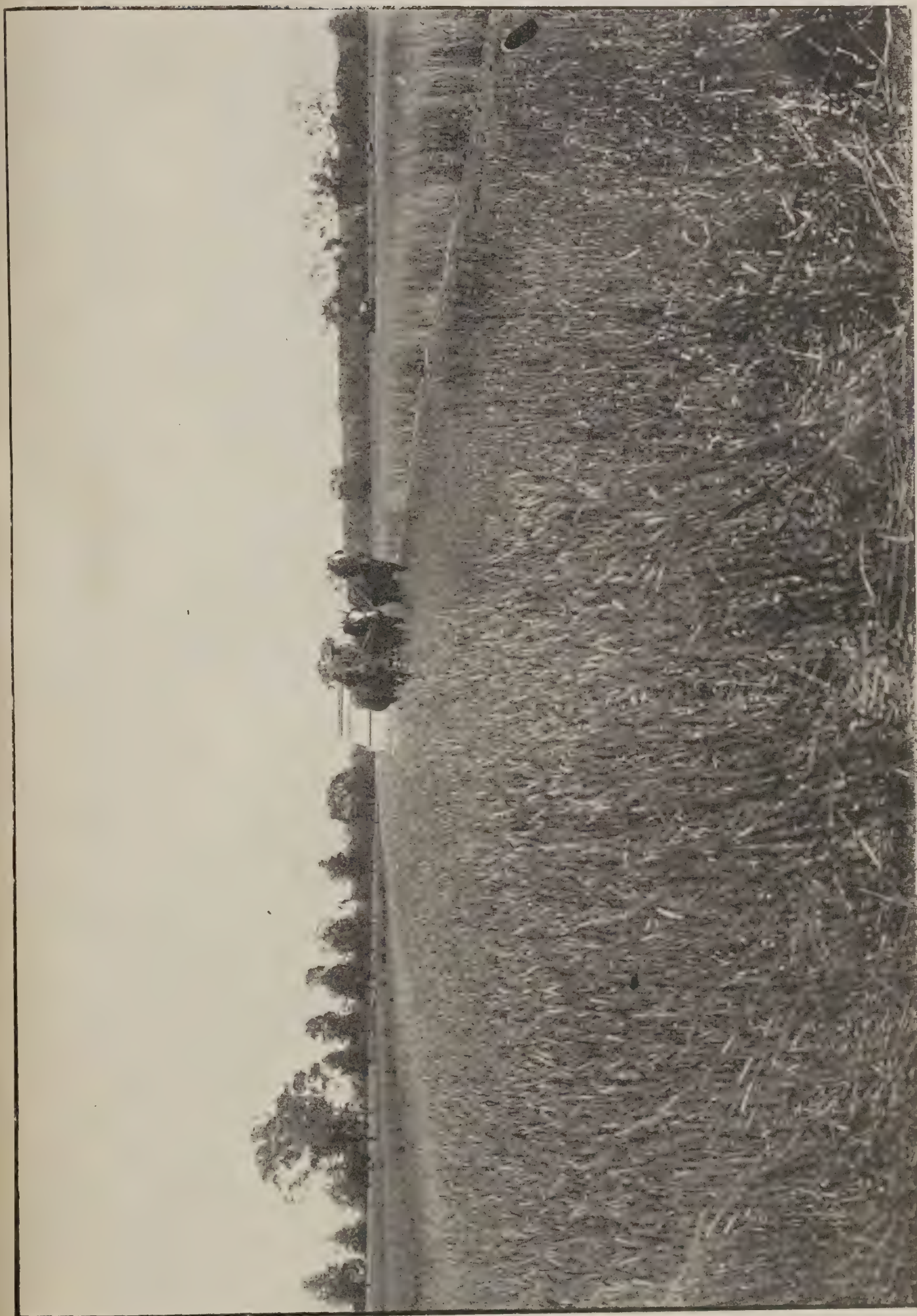


"ALPHA" WHEAT AT THE STATE FARM, ROMA.





*Plate V.*

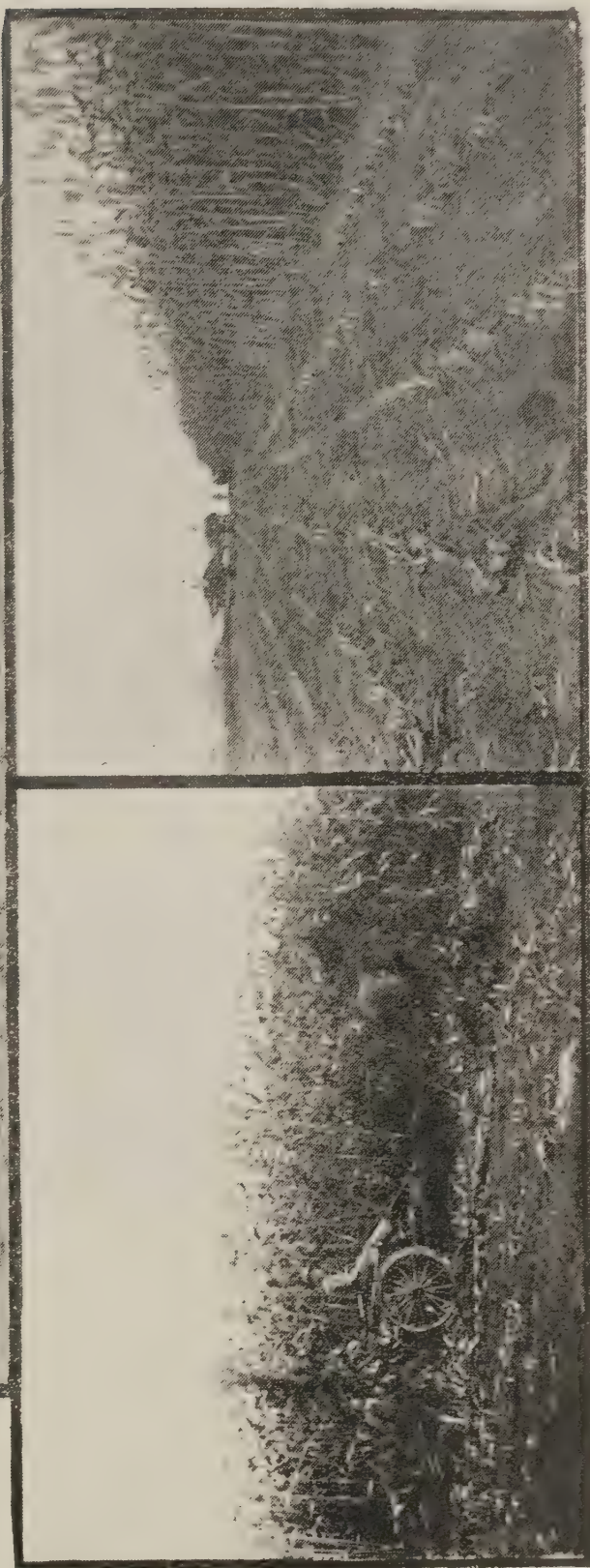


ROMA STATE FARM.—STRIPPER AT WORK ON "PRATT'S COMEBACK."





Plate VI.



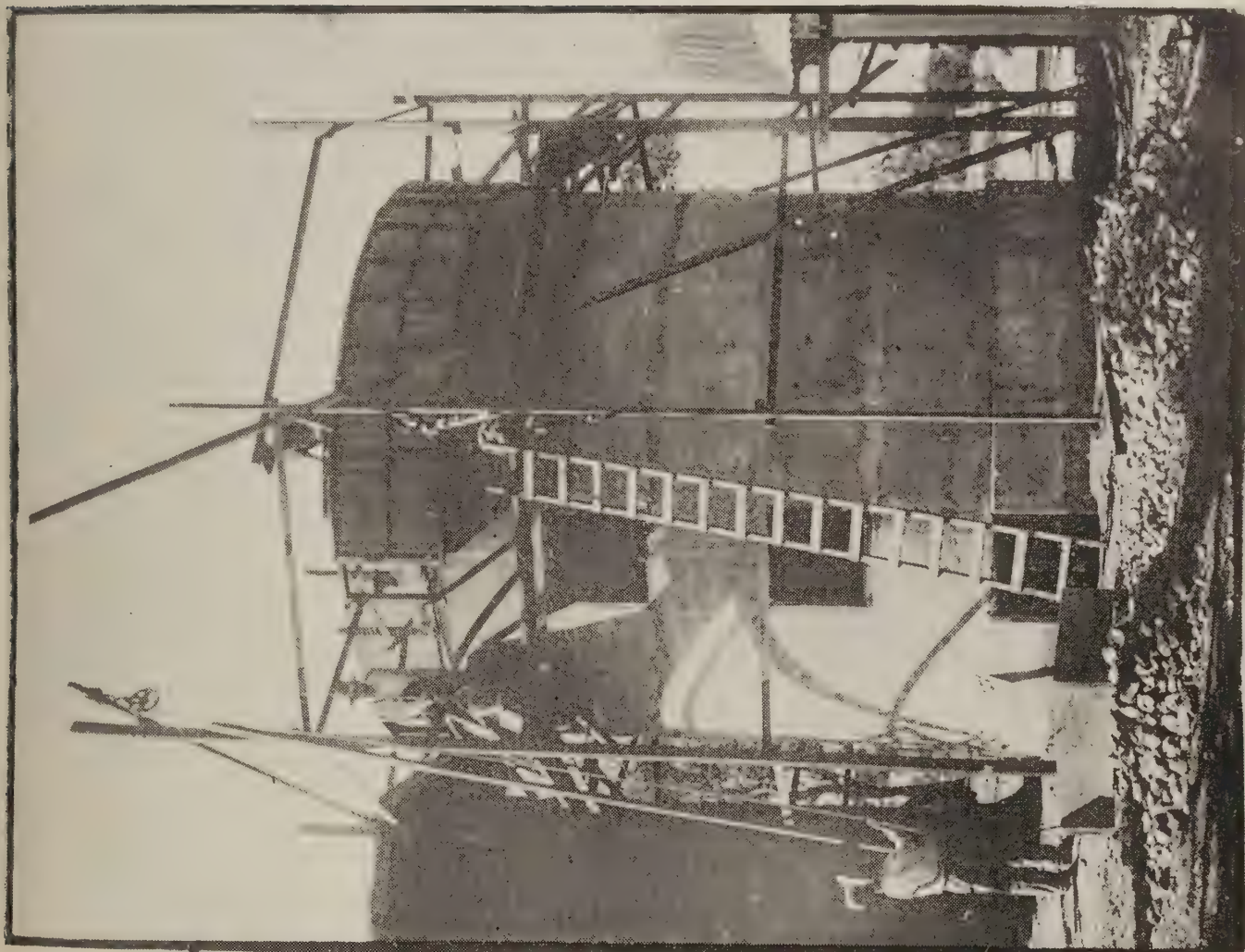
## HERMITAGE STATE FARM.

1. Apprentices' Quarters.
2. Corn Binder at Work on a Crop of Kafir Corn.
3. Carting Kafir Corn to the Silo.





*Plate VII.*



RE-INFORCED CONCRETE SILO IN COURSE OF CONSTRUCTION AT THE  
STATE FARM, ROMA.



RE-INFORCED CONCRETE SILO (120-TON) AT THE  
HERMITAGE STATE FARM.





stud merino ewes confined to small paddocks for the lambing. Some 20 odd tons still remain in the silo, and it is proposed to refill it in the near future.

*Roma.*—The latest type of re-inforced concrete silo (100 tons capacity) is shown in course of erection. The permanency and non-corrosive character of this class of building will be sufficient to justify its popularity.

The wall is 5 in. in thickness, except for a height of 3 ft. from the foundation, which has a thickness of 9 in. The sets of moulds in position at the top of the wall are secured by means of two bolts to each pair of moulds, and rest on the last completed course. Johnson's steel wire lattice, which may be distinguished in position, is made in 3 ft. 6 in. width, and long enough to go round the whole circle, and give a small lap; the 6 in. projecting at top serves to fasten the next roll of lattice to. The diameter of this silo is 18 ft. Gauges are used to keep the wire  $1\frac{1}{2}$  in. from the outside wall whilst the process of filling and tamping goes on.

Work was completed on 8th December, and crops for filling are well forward.

---

### NATIONAL AGRICULTURAL AND INDUSTRIAL ASSOCIATION OF QUEENSLAND.

The following letter has been addressed to the various Agricultural Societies throughout the State, by the council of the above association. The proposal appears to us to be one which should commend itself to the earnest consideration of Agricultural and Pastoral Societies:—

“At the last monthly meeting of the council of the National Agricultural and Industrial Association, it was brought under notice that certain applications from country societies had from time to time come in, having regard to affiliation and to the settlement of various minor show matters of detail with which it is very desirable that all societies in Queensland should be in full accord. It was thought that if all—or, at any rate, a large number—of the agricultural societies of the State joined one chamber for mutual protection and co-operation, it would prove a satisfactory step. We are, therefore, desirous to place before you the following information:—

Name: “Chamber of Queensland Agricultural Societies.”

The following matters would be dealt with—

1. Arranging show dates.
2. Registration of judges.
3. Endorsement of disqualifications.
4. Uniformity in schedules, awards, ribbons, &c.
5. Regulations governing milking competitions.
6. Examination of stallions.
7. Compilation and publication of prize schedule and catalogue.
8. Method of keeping accounts, &c., &c.

An affiliation fee of £1 1s. per annum to cover necessary outlay would be required, and no doubt arrangements could be made that the secretary of the National Agricultural and Industrial Association of Queensland would act in a similar capacity if so desired. Meetings could be held at the National Association's rooms.

Provided sufficient societies are favourable to this scheme, a meeting will be called at a suitable date in Brisbane to formulate and establish the same.

I shall be glad to hear without delay from your society regarding their intention to join in this new movement.

It is suggested that the Department of Agriculture should nominate a representative also to sit with this chamber.

(Signed)

JOHN MACDONALD, Chairman.  
C. A. ARVIER, Secretary.



Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE  
GATTON.

RECORD OF COWS FOR MONTH OF NOVEMBER, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Peewee ...	Holstein-Sh'rth'm	20 May, 1908	763	4.2	35.09	
2	Whitefoot ...	Holstein-Devon	20 Oct. "	984	3.0	32.04	
3	Cuckoo ...	Jersey ...	4 May "	387	7.0	31.63	
4	Orange ..	Guernsey ...	22 Oct. "	721	3.8	30.52	
5	Lily ...	Ayrshire ...	2 May "	492	5.1	28.34	
6	No. 1 ...	Shorthorn ...	1 Nov. "	884	3.0	27.79	
7	Burton's Fancy	"	7 Sept. "	496	5.1	27.63	First calf
8	Daisy ...	Holstein ...	24 Oct. "	939	2.6	27.23	
9	Cuckoo ...	Jersey ...	4 Mar. "	606	4.0	27.08	
10	Len ...	Ayrshire ...	22 Sept. "	661	3.6	26.44	
11	Carrie ...	Jersey ...	16 Jan. "	525	4.4	25.92	
12	Sue ...	Grade Holstein ...	25 May "	611	3.8	25.87	
13	Lady Loch	Ayrshire ...	24 June "	522	4.4	25.77	First calf
14	Hettie ...	Ayrshire-Sh'rth'n	20 Mar. "	448	5.0	25.28	
15	Eve ...	Jersey ...	16 Oct. "	649	3.5	25.18	
16	Ethel ...	Grade Shorthorn	3 Sept. "	667	3.4	25.09	
17	Lubra ...	" Holstein...	5 June "	530	4.2	24.93	First calf
18	Cocoa ...	Jersey ...	10 Nov., 1907	508	4.2	24.89	
19	Dewdrop ...	Holstein ...	10 Nov. "	746	3.0	24.55	
20	Grace ...	Shorthorn ...	30 May, 1908	591	3.7	24.32	
21	Lalla ...	Grade Holstein...	28 July "	525	4.1	24.07	First calf
22	Winnie ...	Shorthorn ...	8 April "	560	3.8	23.71	
23	Night ...	Grade Holstein ...	5 Oct. "	720	3.0	23.07	
24	Remit ...	"	6 Aug. "	673	2.7	23.59	
25	Lark ...	Ayrshire ...	6 June "	546	3.8	23.11	First calf
26	Dot ...	Shorthorn ...	12 Nov. "	471	4.2	22.12	
27	Rhoda ...	Grade Holstein...	28 Mar. "	570	3.5	22.12	
28	Nettle ...	Shorthorn ...	14 May "	603	3.3	21.98	
29	Mona ...	Grade Holstein...	20 Oct., 1907	509	3.8	21.55	
30	Nancy ..	" Guernsey	7 May, 1908	565	3.4	21.25	First calf
31	Lucy II. ...	"	1 May "	368	5.0	20.54	
32	No. 6 ...	Shorthorn ...	27 Oct. "	666	2.6	19.31	
33	Madge ...	Grade Holstein...	16 June "	433	3.9	18.84	First calf
34	Chocolate ...	Shorthorn ...	5 May, 1907	400	4.8	18.35	
35	Maggie ...	Grade Holstein...	6 May, 1908	328	4.8	18.28	

Pastured on natural grasses only.

THE HEREFORD COW AS A DAIRY BREED.

In answer to articles appearing in several papers recommending dairymen to develop the milking propensities of Herefords and make of them a dairy cow, will you allow me to give on the matter the views of "A Young Dairyman."

The latest news from London informs us that a Hereford cow won the milking and butter contest in that city. Is this sufficient to warrant dairymen going in for Hereford cattle as milkers?

What is the Hereford breed? Purely a beef breed. Let us admit for an instant that some strains of that breed have been so developed as to be fair milkers. We might class such animals as of the dual purpose class, of which the red poley is the best type.

What is a dual purpose cow? It is a cow that will produce a fair amount of milk and whose calf will fatten readily.

Is such a cow a profitable dairyman's cow? In my opinion the dual purpose cow is a rank failure from a dairyman's point of view.

What is a steer when weaned worth to a dairyman? At the prices now ranging in Queensland, we may put it down at 30s. at the outside, and that for a very good steer.

Now, suppose we have fed pigs with the milk given to the calf during those six months, would we not have realised as much?

The partisans of the dual purpose cow say that their bull calves raised into steers realise more than Jersey steers.

If that is their only argument against the Jersey, it will not hold water, because—First, I consider that the raising of steers is a mistake on a dairy farm; second, because a cow of the dairy breed will produce several pounds more of butter a year than a cow of the dual purpose breeds.

Thus we have:—

DUAL PURPOSE COW.		DAIRY COW.	
Profit.	Loss.	Profit.	Loss.
A few shillings for a better class of steers	A few pounds for a smaller cream cheque	Greater quantity, and consequently more money for cream A better class of heifers	None  Since the steers are killed and the skim milch turned into pigs

I am a dairyman and a breeder of milking Shorthorns—not because they are a dual purpose cow, for I do not consider them so, but simply because they yield a large amount of milk on a fair test. And I say this—all dairy breeds are equally good for a dairyman, provided he sticks to one, and does not mix them at random. Goodness knows, there are enough dairy breeds to pick from without going in for Herefords. Supposing a dairyman wanted to build up a herd of milking Herefords. He would be starting forty years behind the times. The best he could select as a foundation would only be fair milkers. Let us admit for a moment that he was lucky in securing a sire from a good milker; where would he secure such another, and where would he secure such another again?

There would have to be several working the same problem out to be successful, or else one would run the risk of introducing a sire inferior to one's improved cows, thus deteriorating the herd. Then there would be that inexorable law of Nature—"atavism" in a most marked degree, and the one fair cow would have heifers of a more beefy type. And after forty years of careful breeding one would not then be up to the standard of the fair dairy cow now obtainable in dairy strains.

Then his sons would follow in their father's footsteps:—1. If so, what a trouble to select an ever better class of sires without in-and-in-breeding. 2. If not, then why spend money on improving the Hereford cow, to be at most a dual purpose cow?

It is all right for the breeder who has money to spend, and takes it up purely as a hobby; nay, it is pardonable in a beef breeder to keep the milking qualities of his cows for the supply of the young, but it is foolish if he be a dairyman.

Would it not be a hundred times better to start with a dairy type, possessing good milking qualities, where the law of atavism would not be continually checking one's progress, and where the procuring of improved sires would be an easy matter?



The Hereford, as it is now, is a very hardy beast, but so are the Ayrshire and the Kerry, aye, the Jersey itself (except perhaps in the rearing of the young). But, improve the milking propensities of Herefords, and they will go down in health like all others. Once the strain is applied, the health breaks down.

### A STORY OF TWO COWS.

At the Illinois Agricultural Experiment Station are two cows, the story of whose work is well worth telling. They were brought up alike on a farm near Elgin, Ill., and obtained their early education in the same herd of 100 cows. Here at the University, with the very same surroundings and equal opportunities, they have drifted far apart in character, and their progress has been in opposite directions. It is not a difference of hide, or horns, or temper; it is not that one is wild and the other a pet. It is not a difference of beauty or intelligence, but solely a difference in the way they have worked, a difference in the money they have earned for the owner.

All the milk of these cows has been weighed and tested for years. A record has been kept of every pound of feed consumed by each animal both summer and winter. Each year Gold produced on the average 11,390 lb. of milk containing 405 lb. of butter-fat, but during the same time Gilt averaged only 3,830 lb. of milk with 138 lb. of butter-fat. These cows were both cared for in the same way; they were given the same kinds of feed, and allowed to eat all they wanted. Gold ate one-half more than Gilt, but produced nearly three times as much milk.

Equal amounts of feed made in the one case 188 lb. of butter-fat, and in the other 100 lb. The one cow produced nearly twice as much as the other from exactly the same feed in kind and amount.

Counting the butter-fat at 23 cents per lb., and taking out the exact cost of feed in each cow, the one cow brought in a profit of £6 18s., while the other lacked £1 2s. of paying her board at market prices of feed each year.

This comparison, exact and complete for three years, and including the record of both milk and feed, means a great deal more than a single year's comparison or one in which it is necessary to introduce an estimate.

It would be very gratifying, indeed, if it could be truthfully said that these two records are extreme and exceptional, therefore do not stand for any general condition of the dairy business in Illinois. But the very opposite is true. These two cows represent a large part of the dairy cattle of the State.—“Live Stock World.”

### EXPORT OF BUTTER.

The quantity of butter graded for export by the Department of Agriculture and Stock from 1st August, 1907, to 29th August, 1908, was as follow:—

1907.	Boxes.	1908.	Boxes.
August ...	6,654	January ...	35,190
September ...	7,135	February ...	31,370
October ...	11,177	March ...	32,645
November ...	9,039	April ...	28,615
December...	18,064	May ...	22,796
		June ...	10,189
		July ...	5,231
		August ...	6,405

The lesser quantity graded during the latter three months is accounted for by the shortage of supplies in Victoria, which was made good by shipments from Queensland. The total shipments for the twelve months amounted to 224,510 boxes, equal to 11,225,500 lb., or 100,227 cwt. 2 qr. 10 lb.

## Poultry.

### OSTRICH NOTES.

In an article on "Some Ostrich Food Plants," in the "Transvaal Agricultural Journal," by Joseph Burrtt-Davy, F.L.S., Government Agrostologist and Botanist, some very valuable and interesting information is given on this subject.

As in Africa, so in Queensland, there is sometimes a scarcity of natural grasses during a dry summer, and it becomes necessary to provide green food at such season. This is furnished, says Mr. Burrtt-Davy, by irrigated lucerne, an acre carrying five and even seven birds under favourable conditions. Maize and chopped leaves of the American aloe can be added for the sake of variety, to furnish a more evenly "balanced" ration, and to act as a corrective to the succulence of the green lucerne. The latter, he says, is the king of ostrich foods. A rumour had reached the Transvaal that lucerne produces a poor quality of feather. When, however, he made careful inquiry amongst breeders, he found that the rumour was based on insufficient data. It seems that there is a greater mortality among young chicks if fed *exclusively* on lucerne than when they have some natural veld (native grasses) in addition. With the enormous increase in the number of birds kept on the wild Karroo veld, there is a consequent tendency to over-production of common feathers, and this is likely to increase. Under such circumstances, only high-grade qualities will command good prices, and, to produce these, particular attention must be paid to the feeding of the birds. Variety of diet is found to be as necessary for the successful raising of ostriches as for poultry, cattle, horses, and other kinds of live stock.

With respect to the American aloe (*Agave americana*) as an ostrich food, the writer says that it is found useful in seasons of drought. It cannot be pastured by the birds, but must be chopped up for them. Two men can cut up enough for 100 birds in two hours. This agave is more nutritious than the prickly pear (*Opuntia ficus-indica*), also used as ostrich food, and it can be used without the addition of maize; but it contains an astringent juice, and, if fed alone, proves too constipating; a mixture of prickly pear, or other succulent feed, acts as a corrective to this tendency; 25 lb. per diem per bird is considered a suitable ration. Amongst other suitable foods for ostriches are mentioned green oats and barley, winter wheat, rye, rape, maize, and Australian saltbush. The native species of the latter (*Atriplex capensis*) is readily eaten by ostriches, and the Australian species, of which seed can be had more easily, is equally palatable. Maize is largely used for ostrich feeding, and the ostrich farmers on the Transvaal high veld think it pays them better to buy their grain than to grow it. One farmer stated that his annual maize bill came to £400.

### OSTRICHES AS ORCHARD SCAVENGERS.

A fruitgrower near Grahamstown, who has 150 acres in fruit trees, uses ostriches as scavengers, turning them into the orchard for about an hour each day. During the fruit season they pick up the fallen and damaged fruit, thus preventing it from becoming a breeding place for insects. At other times of the year they keep down the weeds and also manure the ground. They did no damage to the fruit on the trees, but this was, perhaps, because, being left only for a short time each afternoon, they had not time to do more than gather up what lay on the ground.



## IMPORTANCE OF SELECTION OF BIRDS.

There is great variation in the class of feather produced by different birds. The best of feeding and the most favourable climate will not produce high-class feathers from birds of poor quality. The power of producing good feathers seems clearly to be an inherited character. The high standard of feathers attained at the present day is due to steady and skilful selection during some 30 years and the mating together only of wisely selected birds. Perhaps in no industry is the value of selection more clearly demonstrated than with ostrich farming, although it is, perhaps, the youngest of stock industries. Common birds can be bought to-day at £1 per head; but selected, pedigree birds readily change hands at £250 a-piece; whilst Mr. Davy was in the Albany district one choice bird brought £400, and a record figure of £1,000 a pair has been obtained by Mr. White, of Table Farm. Grandchildren of Old Jack of Halesowen, who is perhaps the most famous bird in South Africa, sold last year at £10 a-piece while still young chicks.

## AGE OF DOMESTIC OSTRICHES.

A profitable feature of ostrich farming is the age to which ostriches live, and continue to produce good feathers, when in captivity. Old Jack of Halesowen has been in the possession of Mr. Hilton Barber for 32 years, and how much older he may be is not known. He is probably one of several caught by Mr. Heathcote in Khama's County, whence that gentleman's original stock came. Old Jack cost Mr. Barber £40, and is claimed to have earned no less than £32,000 for his present owner.

## PRICES FOR FEATHERS.

Prices at the last Port Elizabeth show were at the rate of £79 per lb. for prime white feathers. A good bird ready for plucking will average from £6 to £10 per bird per year. Mr. Gilfellan's young birds averaged £5 the last plucking. Plucking begins at the age of nine to ten months, when the first payable returns realise from £3 to £4 per bird.

## OLD HENS FOR THE TABLE.

When hens have reached the age of between two and a-half to three years of age it is high time to get rid of them and supply their places with younger birds. What is to be done with them? The accepted opinion is that they are too tough for the table. If, however, they are properly killed and cooked they are perfectly eatable. In the first place, before being killed they should be kept without food for a day and a-half, when they will keep for a long time in cool weather. When drawing them, instead of making a large cut and inserting the whole hand to withdraw the intestines, the plan recommended in an English poultry journal is as follows:—

Lay the fowl breast downwards, pick up the skin on the back of the neck, slip the point of the knife through, and cut towards the head so as to leave a piece of skin about 3 inches long. Fold this back until the neck is bare close up to the body. There is a spot which shows whiter than the red of the neck. Nick on both sides, and the joint will easily break. Put the knife underneath the neck and scrape toward the head, and cut off the skin at the same length as the other, thus leaving two folds to cover the broken joint, so as to hide the red and make the front of the dressed fowl more presentable. Set the bird on its stern, take the crop in the forefingers of the right hand, and work the outer skin away from it all round. A finger inserted into the front cavity will work the crop quite clear, and it can then be drawn out. Now take the fowl so that its back lies balanced in the left hand. Insert the middle finger of the right



hand, and pass it tightly round so as to break all adhesions and thoroughly loosen all internals from the breast. Turn the fowl over in the hand. The lungs lie in cavities on either side of the backbone near the base of the wings. These may be loosened by inserting the end of the finger in the cavities and levering them out. Push the finger in as far as possible, make a hook of the end joint, and draw back, pressing close upon the backbone so as to break all attachments.

Now set the bird on its neck end, press the thighs well forward until the feet are at the neck end. Take hold of the rectum with the thumb and forefinger of the left hand, and lift so as to almost take the weight of the bird. Make a slight incision, keeping the edge of the knife up, well toward the tail. Insert a finger and press down tightly along the backbone, so as to detach the large intestine. Then curve the finger, and loop up the tail. Now the point of the knife may be placed under it and the rectum cut clean out. This is a neat and perfectly clean way. As the fowl now lies on its back the gizzard is on the right side. Work a finger round the gizzard and loosen what is called the apron fat. Then if the two thumbs are brought to the front of the gizzard (whilst the hands surround the body) it can be forced out through the small orifice. If the bird is held with one hand and the gizzard steadily pulled with the other, all the intestines, heart, liver, and lungs will come out clean, providing the loosening at front has been properly done, without putting the hand in the bird or making a large, unsightly hole. These fowls should be boiled slowly for 2 hours the day before they are to be served, then allowed to cool in the water, and the next day put on and boiled slowly for  $1\frac{1}{2}$  hour. These will be so tender that the flesh will slip off the bones if one is not careful in carving. Another way is to put them in a steamer for three hours, and roast them the next day.

An old hen may be made quite tender by boiling it for three or four hours with a couple of good-sized pawpaw leaves.

---

### HIGH PRICES FOR OSTRICHES.

Mr. Owen Collett, of Lansdown, Trafalberg, has just sold his well-known pair of ostriches, Ruby and Molly, to Mr. Arthur Forbes, for the sum of £1,000. The stock of this pair of birds is much sought after, and realises high prices. We have to report (says "Midland News") yet another big deal in breeding birds and chicks. Mr. Barrett, of Montagu, Fish River, has just sold two pairs of breeding birds at £300 per pair, twenty-nine months old chicks at £17 10s., and also a number of five months birds at £10.

What better encouragement could be needed to induce those who can afford to import good ostriches to follow the example of Mr. T. Behan, of Garfield, near Jericho, on the Central Railway line, who imported a pair of birds from South Australia, and has been eminently successful in raising chicks and marketing feathers?

---

### STATE POULTRY FARMS IN NEW ZEALAND.

"New Zealand Town and Country Life" says:—"A statement of the expenditure and receipts in connection with the State poultry farms shows that these institutions are being run at a considerable monetary loss. The following are the particulars, the larger amount in each case representing the expenditure and the smaller amount the receipts:—Ruakura, £651 and £405; Moumahaki, £624 and £428; Burnham, £742 and £452; Milton, £1,259 and £498. The total expenditure was £3,276, and the total receipts £1,784."



## The Orchard.

### PINEAPPLE-GROWING IN FLORIDA.

By H. HAROLD HUME.

The Florida pineapple industry is now not more than forty or fifty years old. Indeed, considered from a commercial standpoint, it has scarcely more than attained its majority; yet the crop annually produced in Florida is considerably more than half a million crates.

From the most reliable information we have at hand, the first pineapples produced in Florida were grown by Mr. Benjamin Baker, Key West, Florida, from slips obtained in Havana, Cuba, and set on Plantation Key about 1860. By 1870 numerous other small plantings had been made on the neighbouring keys, and by 1876 the plants were so well distributed along the East Coast of Florida that the settlers began to take an interest in them as a commercial crop. In 1879 the first fruit was shipped by Mr. James H. White, Malabar, Florida.

Pineapple culture on a large scale, however, had its origin in the plantings of the late Captain Thomas E. Richards, Eden, Florida. In the summer of 1880 he set 28,000 slips on the beach side of the Indian River. The bears destroyed the first crop produced, and the whole planting was transferred to the mainland. About 1884 the first fruit was shipped. To-day one may stand on any elevated position at Jensen, Eden, Eldred, or elsewhere on the East Coast of Florida and look out for miles over solid fields of pineapples, no other cultivated crop in sight, and during the shipping season the fruit is forwarded by trainloads.

The red Spanish pineapple constitutes about 98 per cent. of the total plantings, Abbachi, Smooth Cayenne, and Porto Rico make up the remainder.

#### AVAILABLE LAND AND CHARACTER OF THE SOIL.

Pineapples are now grown on a commercial scale in Florida, on a narrow strip of land lying between the Indian River on the East and the Savannah or damp prairies on the West. This ridge varies in width from a  $\frac{1}{4}$ -mile to about  $1\frac{1}{2}$  mile, and extends, with numerous breaks of low, moist land, from some distance north of Port Pierce to Miami, Florida, a distance of about 125 miles.

Judged by common standards and for ordinary crops, the soil composing lands shows this ridge would be considered very poor. The early surveyors described it in their notes as not being worth the annual taxes levied in those early days. The chemical analysis of the best lands shows the following composition:—Silica, 97.35 per cent.; lime, .086 per cent.; magnesia, .051 per cent.; potash, .011 per cent.; iron and alumina, .510 per cent.; phosphoric acid, .043 per cent.; nitrogen, .07 per cent.; humus, 1.13 per cent., and traces of other substances. By analysis of many other lands, sand was shown to constitute over 99.32 per cent. of the total composition. From this it will be seen that the amount of essential plant food is a negligible quantity, and without fertilisers the crops could not be produced. The culture of pineapples on these lands is one of the most striking results of the use of commercial fertilisers.

By physical analysis these soils are shown to contain very little fine sand, silt, or clay. They are mostly coarse, and their water-holding capacity is therefore very poor. This is a matter of no small importance, as the pineapple

plant cannot be successfully cultivated in Florida, or, in fact, elsewhere on water-charged soils. In regions of excessive rainfall soils of coarse texture are best.

#### PLANTING.

During the rainy season, July, August, and early September, is the planting season favoured by all planters, preference being given to the month of August, provided slips of sufficient size can then be obtained. Planted during the above period they make considerable growth, and become well established before the winter dormant season sets in.

Nearly all fields are set with "slips" produced from buds on the stem just at the base of the fruit. Some "suckers" produced from buds on the lower leafy stem are also used. Slips fruit in about twenty or twenty-two months after planting, and bear 90 per cent. and over of a crop. Sucker-set fields bear their first crop in about twelve months from planting, but the crop is very irregular and extends over a long period.

The plants are set 20 by 20 in., or 20 by 24 in., about 12,000 being put on an acre. The number varies with the number of alleys or pathways left through the field. The field is carefully marked off, and the planting is done with a dibble. Before planting a few of the basal leaves are commonly stripped off, and the plants are set moderately deep to prevent their toppling over. Soon after planting a small amount of cotton-seed meal should be dropped into the bud of each plant to prevent "sanding"—i.e., becoming blown full of sand. Plants with sand-filled buds have a hard struggle to live, and frequently they must be taken up, the sand shaken out, and reset.

#### MARKETING.

The bulk of the Florida crop is not allowed to reach full maturity before picking. Just before coming to full maturity the fruit is dark black green in colour, with angular, pointed eyes. The fruit is picked in the following stage, when the eyes flatten down in the centre, become elevated at the angles, and change to a pale green colour.

It is gathered by breaking it from the plants. Two men usually work together; one gathers the fruit and tosses it to his helper in the pathway, who catches it and places it in his basket or other receptacle. The fruit is wrapped in paper, then packed in crates holding about one half-barrel. The fruit is sized by the eye as it is packed; the sizes commonly used are 18, 24, 36, 42, and 48 to the crate. Most of the crop is moved during June and July.

#### CULTIVATION.

Until some time after the plants have borne their first crop the field can be cultivated, but when the fields are three or four years old the ground is covered with a mass of plants, and no cultivation is required, or, in fact, possible.

Cultivation of the young fields is done by hand, using a scuffle hoe. After each application of fertiliser the ground becomes crusted, and cultivation should immediately follow. Weeds are likely to start, though neither so numerous nor so troublesome as on heavier soils, and must be destroyed. Cultivation of the young plants is distinctly an advantage; the difference between thorough and poor cultivation is very evident.

#### FERTILISERS AND FERTILISING.

From the very character of the soil it will be seen that fertilisers must be used in considerable quantities—in fact, the whole culture of the crop is based upon their proper use. Experiments with fertilisers have been conducted by the Florida Experiment Station continually for a number of years, and the results for several years have already been published. A glance at the analysis of the soil shows that the land is almost ideal from such a line of



investigation. It supplies a medium for the roots to grow in, with but little plant food of any kind; hence the results obtained may safely be said to be due in an unusual degree to the fertiliser applied.

#### ANALYSIS OF THE PLANT.

The average analysis of the plant, leaves, and stem shows it to contain '826 per cent. phosphoric acid, '681 per cent. nitrogen, and 1'345 per cent. potash, while the average of forty-eight analyses of the fruit is: '42 per cent. phosphoric acid, '070 per cent. nitrogen, and '225 per cent. potash. The fact is noteworthy that potash is an extremely important element in both plant and fruit. Both actual analysis and experimental evidence show that the plant foods, phosphoric acid, nitrogen, and potash should enter into the composition of the fertiliser in the proportion of 4 and 5 to 10, or 4 per cent. phosphoric acid, 5 per cent. nitrogen, and 10 per cent. potash. In the fertilising of many crops nice differences in the effects of fertilisers are not apparent. Not so with the pineapple in Florida soils, as it has been distinctly shown that all sources of plant food are not equally desirable.

*Sources of Phosphoric Acid.*—As sources of phosphoric acid, ground bone, raw or steamed, and slag phosphate have given excellent results. Acid phosphate has invariably produced a condition known as "spike." This is characterised by poor growth, narrow, constricted, greasy-looking leaves, and worthless fruit. Unless the condition is corrected, the plants die. When applications of lime were made with acid phosphate, the plants remained healthy and appeared entirely normal. On the whole, however, it is doubtless best to avoid the use of acid phosphate.

*Sources of Potash.*—Potash has an important bearing on the quality of the pineapple fruit. When supplied in too small quantities, the fruit is deficient in juice and lacking in quality. Unless present in the soil in available form in large amounts, it must be supplied to secure desirable results. The fertiliser should contain at least 10 per cent. potash. The effects of different potash salts are noteworthy. It was shown that those free from chlorides—viz., sulphate of potash, magnesia, and high-grade sulphate of potash—were the best sources. Plants fertilised with both muriate of potash and kainit (both contain chloride) developed "spike." "Manure salts" were not used, but these grades would doubtless produce the same results as kainit.

Both from the experiments already referred to and from field results obtained by different growers, we can recommend dried blood, cotton-seed meal, and castor pomace as good sources of nitrogen. Nitrate of soda and sulphate of ammonia produce spike.

Plants grown with a fertiliser in which all the nitrogen was derived from nitrate of soda were deficient in fibre, with poor crowns and poor carrying quality.

*Size of Fruit Affected by Fertiliser.*—As the amount of fertiliser is increased up to a certain amount, the increased application resulted in larger, more robust plants, and larger fruit. Large fruit, besides increasing the total acre yield, bring a better price in the market.

When a fertiliser containing slag phosphate, dried blood, and high-grade sulphate of potash, analysing 4 per cent. phosphoric acid, 5 per cent. nitrogen, and 10 per cent. potash, was applied to plots at the rate of 2,250 lb., 3,000 lb., and 3,750 lb. respectively per acre, the yields per 100 plants were as follow:—

					SIZE.				
					18	24	30	36	42
2,250 lb. per acre	...	...	...	...	1	9	43	35	10
3,000 "	"	"	...	...	2	22	59	14	0
3,750 "	"	"	...	...	0	50	35	12	0







APRICOTS, GROWN BY MR. H. SLAUGHTER, AT SOUTH BRISBANE.



The most desirable is the 24 size, while 42nds are not worth nearly as much. In size of 24's we mean that it takes twenty-four plants to produce a crate of fruit. Likewise, by 42nds is meant forty-two plants per crate. The measure of the size of the fruit is in a large degree the measure of the yield. In the experiments already referred to, it was proved that the most profitable application of fertiliser is from 3,500 to 4,000 lb. per acre annually.

*Number of Applications.*—During the first eighteen months after the plants are set out, four applications should be made. Afterwards two or three applications per year are the best. For very light soils three are preferable, one in February, one in July, after the crop is removed, and one in November. In sections subject to frost, all, or nearly all, nitrogen should be omitted from the fall application. The nitrogen fertiliser is likely to start growth prematurely, which potash and phosphoric acid will not do.

*Amount of Fertiliser Materials.*—If it is desired to mix the fertiliser at home, one of the following formulas can be used as providing approximately the required composition of 4 per cent. phosphoric acid, 5 per cent. nitrogen, and 10 per cent. potash, and will give excellent results:—

- (1) 800 lb. bone meal, 575 lb. dried blood, 400 lb. high-grade sulphate of potash, 225 filler.
- (2) 800 lb. bone meal, 575 lb. dried blood, 800 lb. sulphate potash magnesia.
- (3) 900 lb. bone meal, 1,000 lb. cotton-seed meal, 500 lb. high-grade sulphate of potash.—“Tropical Life.”

### APRICOT-GROWING IN BRISBANE.

It is very rare to find apricot trees in the neighbourhood of the coast setting their fruit, but that they will do so in isolated cases, and bear heavily, is shown by the results obtained this year by Mr. H. Slaughter, on the Deighton Estate, South Brisbane. A tree in his garden, of uncertain age, has grown to a height of 18 ft., with a spread of branches 36 ft. in diameter. This tree has borne and ripened its fruit on previous occasions, but this season it excelled itself, and has produced a very heavy crop. The fruit is not as large as that produced in the orchards of the Darling Downs and at Stanthorpe, but it is of good flavour, and makes excellent jam. Two trees growing in a garden at Milton, which are over six years old, blossomed freely this year, but produced no fruit.

### EXPORT OF FRUIT FROM SOUTH AFRICA.

A shipment of oranges from Port Elizabeth, South Africa, to London has proved highly successful, and this will doubtless lead to an extensive trade in this fruit between the two countries. The shipment, on arrival, was thus reported on by the Trades Commissioner, London:—“(a) 150 cases navel oranges, each containing fifteen fruits. These arrived in excellent condition and well packed, although the boxes were rather too large for the quantity of fruit they contained. The fruit was very sound and beautiful, and these were probably the best navel oranges seen on Covent Garden this season. They realised £32 17s. 6d., or 4s. 4½d. per box, which is equal to 29s. 2½d. per hundred, or about 3¼d. each. I hope that shipments of this class of orange will be much increased. (b) 100 cases ordinary or Jamaica oranges, containing counts of 96 to 112. They realised 8s. to 12 per case. They arrived generally in a sound condition, only about 5 per cent. being wasty. They were well packed, but in future it would be an advantage if they were more tightly packed.”



# Horticulture

## FLOWER GARDENING, No. 12.

By THE EDITOR.

### PLANTS SUITABLE FOR IN AND OUT DOOR CULTURE.

#### PRIMULA (Chinese Primrose).

The Primulæ are beautiful tender perennials, suitable only for pot-culture. The flowers are of good size and perfect form, combined with brilliant and charming colours. Seedlings, raised in pots in the autumn, should, as soon as the plants are fit, be transplanted. Pot them off into small pots, and place them in a bush-house. As soon as they are again well rooted they should be shifted into blooming pots. The best way to sow the seed is to prepare a soil composed of 2 parts of rotten loam, 1 part of partly rotten peat mould, 1 part decayed cow manure, and a little silver sand. Just cover the seed with some light material such as sifted jadoo fibre, water lightly but thoroughly, then place in the shade, after treatment as above.

#### POLYANTHUS PRIMROSES.

These beautiful, hardy hybrid Polyanthus produce through the spring a wealth of bloom, which can hardly be surpassed for beauty and richness of colouring. Amongst them will be found lovely shades of crimson-maroon, rich purple and deep orange passing through many charming variations of colour to the palest primrose and pure white. The fern-leaved varieties of Primula, known as *Primula fimbriata filicifolia*, are very elegant, with their beautiful divided foliage and splendid, large-fringed flowers.

#### VARIETIES.

*Primula sinensis fimbriata*—Single Fringed, Double Fringed, Chiswick Red; *Alba magnifica marginata*—Blue Fringed; Auricula (Alpine); English Primrose; Oxlip; Cowslip; *Primula japonica*—Polyanthus, gold-laced, &c.

#### DAISY.

These old favourites can be easily grown from seed. They should be sown in a shallow box, filled with light soil, and kept well watered; a cool position will suit best. The seedlings must be planted out when large enough to handle. They are hardy perennials. Sow during autumn and spring.

#### VARIETIES.

Longfellow, Giant Snowball, Fistulosus (double), Delicata.

#### MARIGOLD.

This old familiar plant of English gardens should not be omitted from the Queensland flower garden, where it will grow to perfection. It may be had of many varieties of colour, from pale straw to deep orange, single and double. It is a somewhat difficult plant to transplant without injury. It is best, therefore, to sow the seed in the border where the plants are to remain. It does not require a very rich soil, and, when full grown, rejoices in the full blaze of the sun. Marigolds are very hardy, and are constant bloomers. The French varieties have beautifully-shaped orange flowers, striped and flaked with brown. The African varieties have very large self-coloured flowers; all are annuals.

## VARIETIES.

French Dwarf, mixed colours; French Yellow, double sulphur yellow; African Lemon; African Orange; Meteor, double, beautiful golden colour.

## MARTYNIA.

This is a beautiful sweet-scented, hardy annual. It has beautiful crimson-purple flowers, and makes a nice showy pot-plant. Its gloxinia-like flowers are succeeded by curiously double-horned and hooked seed-pods. Sow in the spring.

## VARIETIES.

*M. fragrans*, crimson-purple flowers; *M. lutea*, yellow; *M. proboscidia*, rose.

## LARKSPUR.

One of our most valuable hardy annuals, very effective in mixed borders and amongst shrubs. The flower spikes are from 6 to 8 in. long, and the flowers themselves are of many beautiful shades of colour. Sow in light, loamy soil where the plants are intended to remain. If allowed to shed the seed, numbers of plants will spring up in the early spring. Larkspurs are both annual and perennial. They are constantly in bloom, and are of great value for cutting.

## VARIETIES.

Double Emperor; double tall German Rocket; Ranunculus-flowered; Stock-flowered; Dwarf German Rocket; Giant Hyacinth-flowered; Candelabrum.

## BORONIA.

This is indigenous in Australia, and among the sweetest-scented plants takes a foremost position, and a whiff of its delicious perfume, which is that of the cowslip greatly intensified, is something not readily forgotten. The boronia belong to the hard-wooded section of plants. It is advisable to buy plants in spring, just about the time they are showing their buds, and I will take this as a starting point in my remarks on culture. Place the plants on a nice light soil and attend carefully to watering, so that the roots are never allowed to get quite dry, neither must they be kept over-watered—failure to observe these items fully being sure to lead to disaster. After flowering let the soil get a little on the dry side; then cut the plants down to within three joints of the last pruning or stopping. For some weeks progress will be slow, and very little water must be given, though it may be increased very gradually as growth is made. The plants may be put out on a bed of ashes in a garden frame, from which the light should be drawn off in all weathers except when rain is falling; the exposure they thus get to air, light, and the night dews finishes up the wood and sets the flower buds. Any plants which appear to require potting should be taken in hand just as the season's growth is completed, as roots are then formed most readily. Take care not to over-pot, as the very slender-foliage plants do not require a great body to support them, and, if given, it only turns sour.

The best soil is good peat and light, fibrous loam in equal proportions and pulled up into small lumps, which may readily be rammed into the small space between the ball (which should be lifted intact except for the removal of the drainage at the bottom) and the sides of the pots. Mix with the soil sufficient silver sand to make it feel gritty and to keep it open and porous.

Pot firmly and solid, adding only a little soil at a time, so that no hollow spaces may be left, and elevate the ball so that none of the stem is buried below the old soil line. Drain the pots carefully with one large piece of potsherd placed with the concave side downwards, and so trimmed with the hammer that it will not rock when in position. This should be covered with  $\frac{1}{2}$ -in. of small pieces, and on this again, to receive the base of the ball, should be placed a little of the most fibrous soil. The pots should be clean, and the plant should



have a soaking of water some hours before it is potted ; then, if the new soil is in that best of conditions known as "neither dry nor wet," no more water will be needed for a few days. Where the plants are grown in large batches they are frequently given a night temperature of 55 degrees to aid the young shoots after they have broken well ; but I do not advise this if, to get the extra few degrees of heat, they have to be put with a mixed collection of plants.

Those who wish to propagate their own plants may take off the young cuttings when about  $2\frac{1}{2}$  in. long. If a slight heel of the old wood can be left at the base, or "slips" instead of cuttings are made, they will be all the more readily struck, but cuttings of the ordinary type will also root. Well drain some 5-inch pots, fill up to within an inch of the rim with sandy soil of the same nature as recommended for potting, except that it should be sifted fine. On this again put about  $\frac{1}{2}$ -in. of pure silver sand, then dibble in the cuttings, water in lightly, and when the foliage has become dry cover the pots with bell-glasses in a temperature of 50 degrees ; shade the glasses from bright sun until the cuttings have struck. Very little water will be needed, and what little is given should be poured gently round the pots just inside the rims, to prevent the centre from becoming too wet. Pot off singly into small pots as soon as well rooted, nurse carefully till established, and then commence to form the desirable bush shape by pinching out the points of the shoots as they lengthen out, repeating this as often as necessary to attain that object.

#### NEMOPHILA.

Where a splendid mass of blue is the object for a couple of months in autumn, this is a most effective plant. It quite eclipses lobelia when seen at a distance, and is one of the generally useful dwarf-growing, hardy annuals. It is very compact in growth, and shows a great variety of colour, which is of a deep, ultra-marine blue, with zone of black purple round the small white centre, in the *Nemophila insignis* and *N. atomaria atrocærulea*.

#### OTHER VARIETIES.

*N. maculata*, flowers white and brown spotted ; *N. discoidalis*, black-brown ; *N. marginata*, blue with white edge.

#### LUPINS.

Of these annuals there are a great many species and varieties, all more or less beautiful. Their fault is that they run to seed too rapidly. The seed should be sown in autumn and spring. Lupins will grow well in any ordinary garden soil. They will bear transplanting, but it is safer to sow the seed where the plants are intended to remain. The pea-shaped flowers on their long graceful spikes are of rich and varied colours. The tall varieties are effective in borders, and the dwarf in beds. They are very useful for cut flowers. The yellow lupin is very pretty, with sweet-scented flowers.

*L. arboreus* is suitable for mixed borders or shrubbery. Sow the seeds 3 to 8 in. apart. The plants require scarcely any water, and grow fast. To save seeds, when the pods on the lower part of the flower-stalk have grown to nearly their full size, the tops of the stalks should be pinched off, when, if the plants are not exposed to too hot a sun, the seeds will ripen gradually and remain plump.

#### VARIETIES.

*L. Hartwegi*, a very pretty blue ; Yellow Tree Lupin, large yellow ; *Dunnnettii superbus*, purple, yellow, and white ; *L. hybridus atro-coccineus*, crimson, scarlet, white-tipped ; *L. luteus*, the well-known old yellow Lupin with speckled seeds.

#### EVERLASTINGS.

Everlastings are curious for the rather large, dry husky flowers they bear. The flowers remain unchanged for many months, and are often used as an

indoor decoration. They grow to 2 or 3 ft. high, and require no particular care. They suit our climate admirably, and produce quantities of flowers of great beauty, white, yellow, rose, and crimson. Sow during Autumn and Spring.

#### VARIETIES.

*Roseum*, double rose; *Alba*, fl. pl., pure white; *Compositum purpureum*, fl. pl., double, crimson; Fireball; Silverball, crimson and silver white.

#### MIGNONETTE.

No particular directions need be given for the culture of this familiar, sweet-scented plant, except that it bears transplanting ill, and that the seed should be sown during April, or during August and September, in patches where the plants are to remain. Mignonette may be kept alive and in blossom a very long time if the flower heads be cut off when they begin to form seed vessels. It will succeed in nearly any soil, and, in gardens where it has been grown for one season, it will come up self-sown in the following. It delights most in a sandy loam, not too light; but, being a gross feeder, a little diluted liquid manure may be given it once a week with advantage. Many of the varieties make excellent pot-plants, and produce spikes of immense size. To form what is called the

#### TREE-MIGNONETTE.

proceed as follows:—Sow in a 4-in. pot. When up, clear off all the plants but the one in the centre. As it grows, train it upwards to a stick, until it is 1 ft. high, or 2 ft., if you please. Do not allow any side-shoots to grow on the stem, and remove all leaves to within a few inches of its top. When the plant gets as high as you wish, top it, and then it will throw out side branches. As they advance, pinch off their tops, till you have formed a nice bushy head to your plant; and, above all, do not allow any bloom to appear until it has become strong.

#### VARIETIES.

*Reseda odorata*, large-flowering, sweet-scented, greenish; Crimson Queen has a beautiful crimson-red flower spike; Golden Machet, large spikes of golden-yellow flowers; Bismarck, an improved Machet, a strong grower, 1 ft. high, very broad flower spikes of a reddish tinge; Machet, dwarf, red flowers; Golden Queen, of pyramidal habit, bright yellow flowers.

#### ALYSSUM.

*A. maritimum* (Sweet Alyssum), a pretty fragrant, white flower, very useful for forming borders, also for masses. It is a hardy annual, bears flowers in great profusion, and, if cut down after flowering, a new growth will be promoted.

#### VARIETIES.

*A. saxatile* is a dwarf, showy, hardy perennial, having yellow flowers and hoary leaves; *Maritimum compactum* (Little Gem), very dwarf, erect variety; *A. saxatile* is valuable for rock-work, edgings, and mixed borders. Sow in autumn or spring.

#### VERBENAS.

Verbenas love a soil well enriched with vegetable mould. The tendency of the stems to throw out roots, wherever they rest upon the earth, sufficiently indicates that it requires frequent renewal of soil. From their trailing habit, when put out in the border, verbenas usually have an untidy appearance. Small circular or oval beds, each filled with a distinct variety, have a most charming and glowing effect during the very long time the plants last in the full height of their bloom. To propagate them, take cuttings or layers from the old plant, remove the two bottom leaves and dibble them in 1 in. apart. When they have made roots about 1 in. long, they may be planted out. Do



not give them too much water, but they must not be allowed to get too dry. They are more likely to suffer injury from drought than from a little overdose of water. Sow in autumn or spring.

#### VARIETIES.

*Coccinea*, a beautiful glowing scarlet; Auricular-flowered, various colours; *Coerulea*, shades of blue, very effective; *Candidissima*, pure white; *Striata*, carnation-striped; *Venosa*, blue.

#### LAVENDER.

The Lavender is the most popular of all perfume plants. Although the plant may be easily raised from seed, the principal method of propagating it is by cuttings or slips. The cutting should be of clean, fresh growth, about 4 to 5 in. in length; the side leaves should be taken off, leaving only the top one or two which are exposed. These should be planted in sandy mould in a frame or box, and supplied with a slight bottom heat, which will assist considerably in getting the young plants started into a healthy and vigorous growth.

The plant grows under almost any conditions. In some parts of the State it becomes quite a coarse shrub. It can withstand great hardship. The late Baron von Mueller stated that it grows well in Norway, in latitude 59 degrees 55 minutes. Yet, with slight shade, it can be grown equally well in temperate and tropical countries. There are few varieties of this flower, amongst them are:—*Lavendula Stoechas*, or Topped Lavender; *Lavendula Vera*, and *L. Spica*. Of these the *Vera* is the best. The plant will remain in bloom for four or five months.

### FLOWER GARDEN CALENDAR.

#### JANUARY.

Roses may still be budded during this month. Annuals for Autumn planting should be sown in pots or shallow boxes in a shady part of the bush-house. Now is the time to prepare for making the flower beds gay and attractive during the autumn and winter months. Fill the boxes with compost, then sow thinly the seeds of annuals. All kinds of shrubby plants may be propagated by cuttings. Thus, pelargoniums, crotons, coleus, and many other kinds of tropical foliage plants can be obtained from cuttings made this month. After putting out cuttings in a propagating frame, shade them with a piece of calico stretched over it. Be careful not to over-water at this season. Propagate verbenas. These require rich soil. Layer carnations, picotees, and pinks. Do this in dry weather, as the stems, being less brittle, are not so liable to break; give the bed a good soaking of water after they are done. Tie up dahlias, hollyhocks, climbers, and other tall plants. Palms may be planted out during this month.

#### FEBRUARY.

Thin out and tie up dahlias. Keep the weeds down. Sow hardy annuals. This is the best month for sowing, as you will be able to keep up a succession of bloom during the succeeding months of Autumn and Winter. To ensure this, sow phlox, pansy, daisy, stocks, aster, nasturtium, hollyhock, candytuft, mignonette, sweet peas, dianthus, carnations, cornflower, summer chrysanthemums, verbenas, petunias, pentstemons, &c. Dianthus, sown now, and planted out in March, will bloom during the whole year, if the dead stalks and blooms are regularly cut away. Plant out stocks, gaillardias, calliopsis (coreopsis), balsams, &c. Water pot-plants morning and evening.

#### MARCH.

Now is the time to plant out bulbs. A complete garden could be furnished with these charming plants, which are to be had in every colour and variety.



Amongst the many are—*Amaryllis*, *anemone*, *arum*, *babiana*, *crinum*, *crocus*, *freesia*, *ranunculus*, *jonquils*, *iris*, *ixias*, *gladiolus*, *narcissus*, *Jacobean lilies*, *tigridia*, *tritonia*. All bulbs like well-drained, somewhat sandy soil, with a plentiful admixture of leaf mould.

Herbaceous plants and annuals, which it is intended to raise from seed, should be sown this month. Such are—*Antirrhinum* (Snapdragon), *asters*, *cornflowers*, *dianthus*, *larkspur*, *daisies*, *cosmia*, *candytuft*, *lupins*, *gaillardias*, *godetia*, *mignonette*, *poppies*, *pansies*, *phlox*, *sweet peas*. *Cannas* now planted will require plenty of food in the shape of liquid manure.

Put in cuttings of carnations. Layer shrubs and roses. *Chrysanthemums* require attention in the way of disbudding, staking, watering with liquid manure, &c. Now, as to climbers which may be planted during March. These are—*Allamanda Schotii*, *Antigonon leptotus*, *Aristolochia elegans* and *A. ornithosephala*, *Asparagus plumosa*, *Beaumontia grandiflora*, *Bignonias* of several kinds, *Bougainvilleas*, *Quisqualis Indica*, *Wistaria*, *Bauhinea scandens*. Prune roses, and plant the cuttings in a shady place.

#### APRIL.

The operations this month will depend greatly on the weather. If wet, both planting and transplanting may be done at the same time. *Camellias*, *gardenias*, &c., may be removed with safety. Plant out all soft-wooded plants, such as *verbenas*, *petunias*, *pentstemons*, &c. Sow annuals as during last month. Those already up must be pricked out into other beds, or into their permanent positions. Growth just now will not be too luxuriant, and shrubs and creepers may be shortened back. Always dig the flower beds rough at first, then apply manure, dig it in, and, after this, get the soil into fine tilth. Land on which you wish to raise really fine flowers should have a dressing of bonedust lightly turned in. Wood ashes also form an excellent dressing. Prune out roses. These may be planted out now with perfect success. Take up dahlia roots, and plant bulbs as recommended for March. *Fuchsias*, *heliotropes*, and *verbenas* may be struck from cuttings; carnations, *picotees*, *pinks*, &c., from cuttings or pipings. Layers that have made sufficient roots should now be gradually severed from the plant, and left for a fortnight before potting, to ripen the young roots.

#### MAY.

Continue planting and transplanting simultaneously as during last month. The plants will thus be fully established before the early frosts set in. Cut back, and prune all shrubs ready for digging. Take up whatever dahlia roots are still in the ground, and place in a shady place out of doors. Plant bulbs, such as *anemones*, *ranunculus*, *snowflakes*, *freesias*, *ixias*, *iris*, *narcissus*, &c. *Tulips* and *hyacinths* may be tried, but success in this climate is very doubtful. All shades and screens may now be removed to enable the plants to get the full benefit of the air. Fork in the mulching, and keep the walks free from weeds. Slip hedges and edgings. Pot plants should have very little water during the coming winter. Prune roses in accordance with directions under that head.

#### JUNE.

No time is now to be lost, for many kinds of plants require to be planted out early to have the opportunity of rooting and gathering strength in the cool, moist Spring time to prepare them for the trial of heat they must endure later on. Do not put your labour on poor soil. Raise only the best varieties of plants, for it costs no more to raise good varieties than poor ones. Prune closely all the hybrid perpetual roses, and tie up, without pruning, to trellis or stakes, the climbing and tea-scented varieties, if not already done. These and other shrubs may still be planted. See where a new tree or shrub can be



planted, and get them in position; then they will give you abundance of Spring bloom. Renovate and make lawns as previously directed, and plant all kinds of edging. Finish all pruning. Divide the roots of chrysanthemums, perennial phlox, and all other hardy clumps. Cuttings of all Summer bedding plants may be propagated. Use the ends of the young succulent shoots of petunias, torenias, heliotropes, verbenas, &c. Pot off such cuttings as have struck. Any dahlias yet remaining in the border should be taken up and stored as directed. Put in well-ripened cuttings of pelargoniums in porous soil. Sow a first lot, in small quantities, of hardy and half-hardy annuals, biennials, and perennials, some of which are better raised in boxes, and transplanted into the open ground, but many of this class can, however, be successfully raised in the open border, if the weather is favourable. Antirrhinum, carnations, picotees, dianthus, hollyhock, larkspur, pansy, petunia, Phlox Drummondii, stocks, wall-flower, zinnias, &c., may be sown either in boxes or open beds; mignonette is best sown where it is intended to remain.

#### JULY.

Winter work ought now to be in an advanced state. The roses will now want looking after. They should already have been pruned, and now any shoots which have a tendency to grow in wrong directions should be rubbed off. Overhaul the ferneries, and top-dress with a mixture of sandy loam and leaf mould, staking up grown plants, and thinning out others. Treat all classes of plants in the same manner as the roses, where undesirable shoots appear. All such work as trimming lawns, digging beds, pruning and planting, should now be got well in hand. Plant out antirrhinums, pansies, hollyhocks, verbenas, petunias, &c., which were lately sown. Sow zinnias, amaranthus, balsam, chrysanthemum tricolour, marigold, cosmos, cockscombs, phloxes, sweet peas, lupins, &c. Plant gladiolus, tube-roses, amaryllis, pancratium, ismene, crinums, belladonna, lily, and other bulbs. Dahlias will now start, and be ready for planting out in August and September.

#### AUGUST.

Continue to look over the roses, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. Trim and repair the lawns. Any roses, camellias, azaleas, &c., intended to be grafted, should now be done. Plant out and sow as directed for July. Plant any dahlias which may have formed strong shoots, but it is better to defer planting dahlias to the two succeeding months. It must be remembered that this is the driest of our months. Plants in the conservatory should be re-potted, as well as those in the green and bush houses, if only to renew the soil, and those that are to be encouraged to vigorous growth should be shifted frequently into larger pots, as the roots reach the sides. Be careful not to give them too much water.

#### SEPTEMBER.

The planting of bulbs should be continued as directed for the two previous months. Protect the plants as much as possible from cold westerly winds, which may still occur. Indeed cold winds, and even heavy frosts, sometimes occur even in October, as happened in 1908. Keep a good look-out for slugs. Plant out chrysanthemums, palms, and all kinds of tropical and semi-tropical plants. If hot weather should ensue after planting, water and shade must be given. Sow dianthus, coleus, snapdragon. Roses will now be in full bloom. Keep them free from aphids, and cut off all spent blooms. The latter work should be done in the case of all flowers. If you wish to save seeds, do not



wait for the very last blooms, but allow some of the very best to go to seed. If you have any toads in the garden or bush-house, encourage them to take up their abode there. (See the note on the value of toads, in Vol. IV., February, 1899.) Fill up all vacancies with herbaceous plants. Plant dahlias in rather dry soil well enriched with old manure. Sow zinnia, gaillardia, amaranthus, cockscomb, balsam, sunflower, marigold, cosmos, summer chrysanthemum, calliopsis (coreopsis), portulacca, mesembryanthemum, calendula, &c. When planting dahlias, each plant should be supported by three stakes in a triangle. Layer camellias, rhododendrons, azaleas, magnolias, &c. Support the spikes of gladiolus now in bloom, by sticks where the plants are exposed. In dry weather, water camellias copiously, the soil being well mulched to prevent it binding, and to keep off the sun. They are greatly benefited by being well "bushed" during the first year after planting. They will not suffer if the shade is even dense, so long as it is above, and does not smother them.

#### OCTOBER.

The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant chrysanthemum, gladiolus, and other bulbs, such as tuberose, crinum, ismene, amaryllis, panicratum, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep them free from aphids, and cut off all spent flowers. Get the lawn-mower out, and keep the grass down. Hoe the borders well, and trim the grass edges. Layer pelargoniums as soon as the shoots are ripe, as they root freely at that stage. Stop chrysanthemums regularly as they throw out their lateral shoots, as soon as they are 2 in. long, to make the plants more dwarf and compact, and give them a little liquid manure occasionally before they come into bloom.

#### NOVEMBER.

Stake any dahlias which may now be above ground, and plant out the bulbs which were stored in a moist place. If the weaker bulbs are reserved, they will come in for Autumn planting. Take up all bulbs which have done flowering, and store them in a dry place. Winter-flowering plants will have almost gone off; still, the garden should be in full bloom, and will well repay the trouble bestowed upon it, and a little fertiliser given as a top-dressing will assist the plants to bloom, and look well for a longer time than if they were neglected. Give weak liquid manure to chrysanthemums, and allow no suckers to grow till the plants have done flowering. Take up narcissi. Do not store them, but plant them at once in new situations. Sow antirrhinum, balsam, zinnia, summer chrysanthemums, calliopsis (coreopsis), and nemophila. At the end of the month a few roses may be budded. Layer pelargoniums.

#### DECEMBER.

Keep the surface of the soil well stirred. Bud roses. A few annuals may still be sown, such as balsams, calendulas, cosmos, calliopsis (coreopsis), marigold, nasturtium, portulacca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and as the flower-buds develop give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Propagate carnations, picotees, pinks, &c., by cuttings, pipings, or layers.



## Botany.

### CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By F. MANSON BAILEY, F.L.S., Colonial Botanist.

#### Order LEGUMINOSÆ.

##### ACACIA, Willd.

*A. dineura*, *F. v. M.*, Journ. Linn. Soc. III., 130 ; *Fragm.* XI., 65.; *Flora Austr.* II., 391 ; *A. binervata*, DC., form *dineura*. A glabrous tall shrub or small tree. Phyllodia more or less glaucous-falcate, 2 to 4 in. long, 6 to 9 lines broad, glandular-obtuse at the end ; longitudinal nerves two or three prominent, reticulate veins close and prominent, some often joining and forming intermediate longitudinal nerves, marginal gland near the base sometimes, perhaps, wanting ; the inflorescence appearing like a terminal leafy panicle, 6 in. long and broad, from the close erecto-patent racemes of globose flower-heads at the ends of the branches. Racemes, 2 or 3 in. long, slender ; peduncles very slender, about 6 lines long ; globose head of flowers about 3 lines diam., flowers numerous, 5-merous ; calyx ciliate, much shorter than the corolla. Pod flat and thin, about  $3\frac{1}{2}$  in. long, 5 lines broad, prominently raised over the seed, more or less stipitate, pointed at the end. Seed sub-lentiform, 2 lines diam.; funicle folded and dilated under the seed, but not surrounding it, in some of the dry pods appearing slender and straight.

Hab. : Stannary Hills, *Dr. Thos. L. Bancroft*.

The above description differs from Baron Mueller's diagnosis, in *Fragm.* and figure, in his "Iconography of Acacia"; however, I think there can be little doubt of its being identical with the species here given.

#### Order RUBIACEÆ.

##### PAVETTA, Linn.

*P. tomentosa*, *Sm.*; *W. and Arn.* = *Ixora tomentosa*, *Roxb.* A tall shrub or small tree closely allied to *P. indica*, Linn. Leaves coriaceous when old, lanceolate, about 3 in. long and nearly 1 in. broad, pubescent on both faces, crowded at the ends of the branches. Flowers in small dense corymbs, lateral or appearing so from the growth of the shoot, the whole inflorescence and calyxes hoary-tomentose. Calyx-limb small, with minute teeth. Corolla, fruit, and seeds of *P. indica*.

Hab. : Stannary Hills, *Dr. Thos. L. Bancroft*.

Sir J. D. Hooker, in *Fl. of Brit. Ind.* III., 150, places this plant as a variety of *P. indica*.

#### Order PROTEACÆ.

##### TRIBE, EMBOTHRIEÆ.

##### STENOCARPUS, R. Br.

*S. Cunninghamii*, *R. Br.*, *Prot. Nov. Fl. Austr.* V., 540. A graceful tree, about 20 ft. high ; diameter of stem at base, 5 in. Branchlets slender, dark, angular, more or less hoary when young. Leaves usually erect, linear, 2 to 7 in. long, 2 to 3 lines broad, tapering towards the base, entire or sometimes

bearing a few lobes similar to the entire leaves, the apex blunty or elongate-acuminate, midrib and venation often faint, the longitudinal nerves from 3 to 6. Inflorescence terminal on the short shoots near the ends of the branchlets, whitish from being clothed with silvery hairs. Bracts short narrow-lanceolate. Peduncles very slender, 1 to 2 in. long, often bearing a few scattered flowers below the terminal umbel; flowers in each umbel, from 12 to 20; pedicels, 4 or 6 lines long. Perianth-tube 3 lines long, limb globular, 1 line diameter. Ovary and stipes silky-pubescent, style glabrous, furrowed; stigma dilated, hypogynous glands hippocrepiform within the prominent surrounding cup. Follicle, 2 to 3 in. long, stipitate, before expansion 3 lines broad, brown with numerous longitudinal nerves, swelled over the seeds, giving to the follicle the appearance of a 4 or 5 seeded legume.

Hab.: Stannary Hills, *Dr. Thos. L. Bancroft.*

This little known species has not previously been met with in Queensland.

Statistics.

COMMONWEALTH METEOROLOGY.  
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.		1908.										
	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
<i>North.</i>													
Bowen ... ..	3·71	6·39	10·14	5·63	9·46	3·73	0·99	0·45	0·88	0·51	0·96	2·47	0·42
Cairns ... ..	5·35	28·33	27·02	8·03	20·60	5·99	3·05	0·59	3·70	2·12	0·74	3·07	1·60
Geraldton ... ..	6·45	33·82	44·39	13·27	39·00	14·23	18·52	2·64	8·11	3·66	2·81	6·93	3·80
Gindie State Farm ... ..	1·57	4·42	0·20	7·17	6·25	0·02	0·112	...	0·40	1·27	...	...	...
Herberton ... ..	3·41	9·57	9·29	5·02	8·92	1·40	0·38	0·31	2·36	Nil	0·51	1·27	0·61
Hughenden ... ..	0·66	7·75	0·98	5·18	6·91	0·30	Nil	0·05	0·68	Nil	Nil	1·67	1·94
Kamerunga State Nurs.	2·76	29·82	...	7·47	25·75	4·60	3·363	0·76	4·85	1·58	...	3·64	1·69
Mackay ... ..	5·76	9·70	9·28	3·83	17·43	14·82	3·25	1·29	1·65	0·71	2·27	1·80	2·57
Rockhampton ... ..	3·72	4·42	3·84	9·64	9·77	2·62	0·85	0·10	1·08	0·84	0·20	2·14	2·47
Townsville ... ..	2·82	24·26	12·21	6·69	9·03	0·38	2·22	Nil	1·70	0·27	0·28	1·58	1·26
<i>South.</i>													
Biggenden State Farm	2·50	5·55	2·37	9·82	9·84	2·97	0·74	0·43	0·49	2·33	1·39	1·80	2·12
Brisbane ... ..	4·25	3·21	2·80	8·43	18·19	2·45	2·40	0·17	0·77	2·83	0·67	1·77	2·25
Bundaberg ... ..	2·90	2·99	4·77	2·82	7·35	4·13	0·67	0·39	0·75	1·56	1·10	2·39	0·73
Dalby ... ..	5·18	1·44	0·17	4·88	7·61	0·11	0·37	0·63	0·14	1·80	1·13	2·55	3·65
Esk ... ..	3·76	3·72	2·61	10·06	17·04	2·83	1·07	0·23	0·46	2·75	2·16	1·29	5·99
Gatton Agric. College	3·01	4·55	...	3·38	10·74	...	0·10	0·16	0·6	2·71	1·84	1·93	5·71
Gympie ... ..	3·05	5·49	6·26	11·77	8·08	1·87	2·00	0·38	1·16	2·87	1·37	2·49	2·58
Ipswich ... ..	4·45	3·40	1·32	6·63	13·77	2·71	1·14	0·12	0·47	3·23	1·19	1·48	5·09
Maryborough ... ..	3·49	5·81	5·62	8·07	11·40	2·52	1·05	0·46	0·81	1·98	1·05	1·84	1·92
Roma ... ..	3·70	2·51	0·04	6·38	2·51	0·22	Nil	0·55	0·63	1·38	1·12	2·15	2·79
Roma State Farm ... ..	...	...	...	...	...	...	...	...	1·27	0·73	...	...	...
Tewantin ... ..	3·12	7·36	10·42	12·47	14·39	7·59	8·66	0·75	1·97	2·70	2·18	2·30	7·50
Warwick ... ..	3·25	3·13	0·76	4·52	6·65	1·40	0·15	0·80	1·24	2·99	1·96	0·96	5·28
Westbrook State Farm	4·76	3·23	0·43	8·03	1·41	1·40	00·5	...	0·49	1·97	...	...	2·05
Yandina ... ..	2·87	3·05	8·37	14·47	16·62	5·45	4·59	0·58	2·64	2·18	1·50	3·10	6·03

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,  
Divisional Officer.



## Apiculture.

### BEE NOTES.

Mr. G. Butler, hon. sec. Queensland Beekeepers' Association, forwards the following bee notes:—

“Travelling through the Kilcoy district recently, Mr. D. Jones, president of the Queensland Beekeepers' Association, had several inquiries from bee-masters as to the condition of the industry, and particularly in reference to the activity of the Beekeepers' Association. The president was able to impart such information as the questioners sought, and enlist further interest in the objects of the association. The subject of requeening colonies was a prominent topic, and the opinion was freely expressed that a periodical introduction of new strains of queen bees would, to a great extent, by added vigour to the hive, generally compensate for lack of blossoms. Discussing the season's work with Mr. Horne, one of the oldest established beemen in the Woodford district, satisfaction was expressed at a return of 800 lb. of high-class honey from twelve hives. This, in view of the adverse seasonal conditions, may be regarded as a very good return. Mr. Jones informs me also that in the Kilcoy district the forest trees have been badly affected, as before reported of other places, by the caterpillar pest. The ravages of these insects will, it is hoped, be only an occasional attack, as otherwise not only will apiarian interests be adversely affected but our timber supplies, particularly hardwood, will be a diminishing quantity. In some instances the trees die outright as the result of the leaf denudation; others recover, but seem to be a long time regaining their vigour. This, of course, results in meagre bee-food in localities thus ravaged.”

---

### DEMONSTRATION FARMS IN THE UNITED STATES.

During the past few years, says the “Journal of the Board of Agriculture,” London, an important scheme of demonstration work has been conducted by the United States Department of Agriculture, with the object of showing by numerous practical examples over a large area the advantages of improved methods of agriculture. The work was started in consequence of the depredations of the Mexican cotton-boll weevil, which threatened the entire destruction of the cotton crop in many districts. Since 1904, a grant of £15,500 has been made annually by Congress, and this was supplemented in 1907 by a grant from the General Education Board of £13,800, so that together, with some local contributions, a sum of about £33,500 was available in 1907-8. Agents have been appointed throughout Texas, southern Arkansas, Oklahoma, Louisiana, and a portion of Mississippi, and the work is also being carried on to a more limited extent in Alabama, Virginia, Carolina, and Georgia. Altogether 143 agents are employed, and with this force about 12,000 demonstration farms had been established and, in addition, 20,000 farmers had agreed to co-operate and make reports on results. The term “demonstration farm” is used to designate a portion of land on a farm that is worked strictly according to instructions. This is visited by an agent once a month, to see that these instructions are carried out, and to give further advice if necessary. The farmers who work in co-operation also agree to cultivate their crops according to instructions, but are not visited regularly by the agents.



## Tropical Industries.

### THE "PULQUE MAGUEY" OF MEXICO.

Under the title "The Century Plant and some other Plants of the Dry Country," Professor William Trelease, of the Missouri Botanic Gardens, contributed a highly interesting paper to the "Popular Science Monthly" of March, 1907, dealing with the various agaves found in Mexico and their characteristics and uses. This paper includes a lengthy account of *Agave atrovirens*, or the "pulque maguey," from which the national alcoholic drink of Mexico is produced. The details given below as to the methods followed in the manufacture of pulque, and the extent of the trade in this product, are extracted from Dr. Trelease's article:—

South of the city of Mexico, centreing about the little town of Apam, the species of agave is almost exclusively the dark-green giant *A. atrovirens*, though, as with extensively cultivated plants elsewhere, it is grown in numerous horticultural varieties which look much alike to the botanist but are distinguished by the planter. Over thirty such forms are said to be planted in the plains of Apam.

As one passes to the colder regions of the north or descends from the tableland into the hot country, still other and different looking species of the same type replace *A. atrovirens*, which, however, far outnumbers and surpasses them all in its aggregate importance. These plantations of *A. atrovirens* are the basis of the pulque industry of Mexico—at once a large item in its agricultural wealth and one of the greatest curses of its labouring population.

The present traffic in pulque is large. Something over 5,000,000 barrels of it are used in the Mexican republic every year, of which quantity about half is consumed in the capital city, and much of the remainder in Puebla and the other large cities of the central plateau. Cheap as it is (for it sells for from 1 to 3 cents of Mexican money for a large glass), its aggregate value amounts to several million dollars per year. Special trains are run into the city of Mexico every morning for its delivery, as is done with the milk supply of American cities. In the Apam district, the plantations are chiefly found on the large haciendas or estates.

The "pulque maguey" is a large plant, and its rosette of thick leaves, though appearing to lie next the ground, is really spaced along a stout trunk as large as a small barrel. The whole, charged with sap, weighs several tons. If left to itself, as it is in gardens on the Riviera, where it is called *A. salmiana*, like the century plant *Agave americana*, it produces a gigantic scape, topped with a candelabrum of flowers, when somewhere in the neighbourhood of fifteen years old. This is never permitted on the large plantations, for the plant possesses its maximum value when it has reached vegetative maturity and the scape is about to develop. At the critical moment, known from the appearance of the central bud, this is cut out, and a shallow cavity is made in the crown of the trunk, which is covered by a stone, pieces of maguey leaves, or other protection. Into the cavity so formed the sap exudes.

It is removed two or three times a day, the surface being scraped and the cavity slightly enlarged each time, until at last nothing but a thin shell of the trunk remains, the leaves meantime having given up their content of fluid and dried to their hard framework—as happens naturally during the flowering period of all the larger agaves, when the reserve of sap is drawn into the rapidly growing scape and flowers.

For a period of three months or more a good plant yields a gallon or two of sap daily, and its total value may be not far from 10 dollars on an average, from which it will be seen that a large maguey plantation represents a considerable item in the assets of a landed proprietor of the plains of Apam.



The fluid which collects in the hollowed trunk of a cut maguey plant, and is gathered in the manner described, is called "agua miel," or honey-water, because of its sweetness; 9 or 10 per cent. of its weight is sugar, and this furnishes the basis for the alcoholic fermentation which is the chief factor in its conversion into pulque. The "agua miel" of the Apam district is thin, clear, and colourless, and possesses a rather pleasant taste.

The fermentation practices in pulque making are still mostly primitive. I have had a Mexican gentleman tell me that, although when the agua miel was gathered and fermented with due cleanliness he considered it a delicious drink, he would not think of touching pulque as offered, for instance, at the railway station at Apam. The vats used in the fermentation are of ox-hide stretched on frames, and they are usually 3 or 4 ft. wide, and nearly as deep. Fermentation is begun by the introduction of a starter or "mother of pulque," obtained by preliminary fermentation, and is carried on either without, or at most with little, artificial control of temperature, and under conditions of positive or negative cleanliness which differ with the various haciendas.

When marketed, the pulque is a white, decidedly viscous fluid containing about 8 per cent. of alcohol; fermentation has not been solely alcoholic, however, and its flavour is in part due to changes wrought by bacteria of several kinds which are introduced with the starter in company with the yeast. Continuation of the action of these collateral ferments causes the beverage to spoil in a day or two under ordinary conditions.

Where the maguey, though capable of cultivation, yields a lesser or inferior product, agua miel is often more appreciated in its unfermented state. As hawked around the streets of Monterey, for instance, in porous earthenware receptacles, it is a cool, yellowish fluid, that is very refreshing on a hot day, and the limpid, yellowish, cidery, foamy product of its fermentation in the north is frequently more to the taste of the foreigner than the white, viscous, odoriferous pulque of the Apam district—which alone pleases the adept.

Considerable medicinal virtue has been claimed for pulque, and some efforts have been made to specially prepare, bottle, and pasteurise it for medicinal or even table use; but, except in the region of its production, where it is the common beverage, the bulk of it is used as an intoxicant, pure and simple. From it is also produced a rather small quantity of distilled liquor—"mezcal de pulque."

Mezcal is a term applied comprehensively to the liquor obtained by distillation from the fermented juices of agaves. Four or five million gallons of it a year are produced, and its value may amount to some 2,000,000 dollars. The centre for the manufacture of this beverage is to the west of Guadalajara, and the town of Tequila, situated there, has given its name to the higher grade of liquor, which is clear, smoky, rather smooth, and with a characteristic essential flavour; it usually contains 40 or 50 per cent. of alcohol, and, like pulque, possesses certain medicinal properties.

Mezcal is sold cheaply. It is to be found everywhere, and contributes largely to the demoralisation of the native labourers, who often drink it to excess.

To supply the distilleries at Tequila, a considerable acreage is planted to mezcal agaves. Those chiefly used for the purpose belong to a well-marked, narrow-leaved species, which a few years ago received the appropriate and distinctive name *A. tequilana*.

---

#### BRITISH NEW GUINEA AS A PLANTING COUNTRY.

We ("Tropical Agriculturist," Ceylon) direct attention to the admirable series of "Notes" with which Mr. Wallace R. Westland (son of the well-known Ceylon veteran, Mr. James Westland) has favoured us for publication. Mr. W. R. Westland has been long enough a planting pioneer on the Papuan coast to enable his information to be regarded as both trustworthy and most useful to



any capitalist looking for "fresh fields and pastures new" in the direction of New Guinea. He details the drawbacks very faithfully; but he is equally clear as to the attractions and advantages. Cheap land, finest soil, good climate, and a considerate Government are bound to tell; while the drawbacks which circle chiefly round the labour and absence of roads, &c., may be gradually modified and improved. Meantime, let each one interested study Mr. Westland's very full and interesting notes.

## PLANTING IN NEW GUINEA.

BY AN EX-CYLON PLANTER.

Kanosia, Mann Mann, Papua, 2nd August.

The following notes on this island may be of interest to you and others in Ceylon who are on the lookout for rivals to the rubber-planting industry. It must be understood, however, that the views set forth are purely personal, and may require modification as fuller knowledge and more experience are acquired.

To begin with, Papua is reached from Ceylon *viâ* Singapore and Thursday Island, or by way of Sydney to Brisbane, where there is a choice of routes—by the Solomon Islands to Samorai and Port Moresby or to Cooktown—thence to the two ports named.

The latter is the better route, Port Moresby being opposite to and about forty-eight hours' steam from Cooktown. The passage either way is made in comfortable boats, fitted with electric light, refrigerator, &c.

The island, or rather British New Guinea, is flat on the coast, rising rapidly inland range upon range to the main chain of mountains, the highest peaks of which are a great many miles from the sea and 13,000 ft. above it. This gives the visitor every temperature from the sharp frosty air of Mount Victoria to the steamy heat of Samorai, and ensures a heavy and well distributed rainfall. Indeed, some of these ranges must rival the famous Dolosbage, where a week's dry weather elicits a despairing wail from your correspondent about the "awful drought."

The island appears to have two regular monsoons—south-east and north-west—the former being comparatively dry and the latter wet. No severe gales have been known for years and but few trifling earthquakes.

The means of communication between ports are small mail steamers and a number of sailing vessels of all descriptions from about 60 tons downward. Places inland are very much worse off, there being no roads. A few bridle paths (perhaps 50 miles in all) have been cut, but a properly made and graded cart road does not exist. The villages are connected by the ordinary jungle track, quite impassable for horses and often very difficult for laden men. The only means of getting any distance inland is, therefore, by river, of which there are many beautiful ones, most of them navigable for whaleboats for great distances, some of them allowing the passage of small steamers three days' steam up their course.

The east coast—from Samorai to Port Moresby—has the advantage of a barrier reef; inside it small boats can run up and down in comparative safety. So much from the tourist's point of view; now for the planter's.

The soil varies considerably, from the fat black sandy loam in the river valleys and the rich red basaltic soil of the low foot hills, where rank vegetation and heavy crops prove its fertility, to the poor wind-blown sandy coral ridges where stunted grass fights seadrift for a living.

The deep valleys in the mountain ranges must contain some magnificent soil, far richer than anything we can produce in Ceylon, to judge by the deposits and colours of the rivers in spate. All the old explorers are agreed that this island contains some of the most fertile soil in the world.



The land is assumed to belong to the natives, and is purchased at low rates from them by Government from time to time as opportunity occurs. In some cases, owing to the Survey Department being greatly undermanned and the absence of a trained land buyer, huge blocks were bought in a most perfunctory way—the areas and boundaries being indefinite to the last degree. This has now ceased, and drastic changes have occurred in these departments.

The intending planter may now select and apply for any block of land, depositing with his application a small fee, proportionate to the area required.

If the land applied for already belongs to Government, and if he satisfies them that his intentions are *bonâ fide*, the land is usually granted at once, and he is free to commence operations forthwith.

Should the block belong to natives, the A.G.A. of the district is instructed to endeavour to purchase it from them. If he succeeds, the procedure is as above; if not, the applicant is informed of the fact, and invited to select another block somewhere else. No direct purchase between planter and native is permitted.

The land is granted as leasehold for 99 years on most liberal terms, there being no survey fee and no rent for ten years; after which 6d. (maximum) per acre becomes due annually. One-fifth of the area suitable for cultivation has to be under cultivation five years from date of grant.

The areas at present taken up are mostly for cocoanut and rubber planting along the coast. There are several small estates inland in coffee, and more land is being applied for in their neighbourhood. A new industry is commencing in sisal hemp, some large blocks having been secured recently and a start actually made.

One great factor in all tropical agriculture is labour; that of British New Guinea is one of the most interesting problems any country can present.

The labour here is the native Papuan in an extraordinary diversity of type, language, and disposition.

The native from the eastern and central divisions of coastal districts is, as a rule, a light-hearted cheerful man, ready to laugh or sing all day long, and make light of a task. If well-fed and looked after, he is as ready to raise a cheer and a yell at the end of his day's work as at the commencement. Some men have a bad reputation, and it is not wise to trust them too much yet, but their main failing is that there is not more of them! The Mawata and Kiwai district men in the west are more pearl divers and boats' crews than coolies, although a few are found here and there along the coast. The Gulf district, which is said to teem with natives, and is the only district where they may be said to be in thousands, gives the worst class of labour. They are greedy, sulky brutes, without any idea of steady work. They cannot count beyond five, have very little intelligence, and are only fit for pack-carriers. The miners in the eastern districts will have none of them, except as porters. They are in every way quite unsuited for estate labour.

The remaining class, the bushman, is as wild as a hawk, and cannot, for a long time yet, be depended on for anything but spasmodic labour. At present he is usually too scared to approach at all, and as often as not bolts out of the village on the first alarm. Once tamed, they are said to be excellent. The estate labour is indentured; on the whole, the laws may slightly favour the native. A man is signed on for any period up to three years. At the end of that time the employer has to return him to his home—free. Contract can be broken by mutual agreement; or, in the event of the employer wishing to rid himself of the man, the latter can demand his wages for the full period. Conversely, if the man bolts, the employer can imprison him, and add the term of imprisonment on to his term of service.

No native women have signed on as estate coolies yet, owing doubtless to the tales their men-folk have spread on their return from mining camps or carrying tracks. These occupations have been the most important hitherto.



and are not ones which would appeal to women. It is hoped that by establishing villages on the estates, giving each married man a little hut to himself and keeping each little tribe together, the native will not want to leave the estate when his contract of service expires, but settle down for good. Do not we all know the coolie who has been man and boy on the same estate all his life? Estate work is practically unknown in British New Guinea, and *festina lente* the best motto to write across the muster roll.

As to cost: The recruiter charges, say, £2 10s. per head landed on the estate, 3s. Government fees, signing on and off, &c., and 10s. return passage; so that each indentured native costs £3 3s. For a three-years-agreement-man the rate is £6 2s., all of it irrecoverable. Kit has to be supplied from motives of policy to keep the man in health—blanket, mosquito net, plate, pannikin, spoon, billy can, cooking pot, jumper, and waist cloth. Food is a much-vexed point. By the Government regulations the employer is required to supply him with good and sufficient food. Rice is now £15 to £17 per ton at Port Moresby (transport inland extra). Sago flour, an excellent food, £6 10s., when obtainable. It may be had at times, but only in small quantity and irregularly. Of sweet potatoes, yams, taro, &c., no large supply is available, and it is doubtful whether the cost of cultivation and harvesting balance the saving of time and labour in giving imported foods.

Chillies, currustuffs, and the “selavu,” so dear to Ramasamy, are unknown here.

Wages are 10s. per month, wet or fine, sick or sorry, and no Sunday work. They are due at the end of term of service, and must be paid before a native labour officer. An advance may be given from time to time, but the practice is discouraged, as the native has then nothing to take back to his village.

All these things combined make labour work out at not less than 1s. per working day at a low estimate.

All skilled labour is at present white, and cost £12 to £19 per month for carpenters, boatbuilders, &c. Coloured foremen may be imported at the discretion of the Government, and are granted a certificate for a term of years, which must always be specified. At the end of their term they have to leave the country under penalty of £50 fine. . . .

The present rate of wages for black and white labour is absurdly high all round. Fancy a new country, endeavouring to attract capital, hanging this millstone around the capitalist's neck. When competition or skill enhances the value of the labour, let wages rise by all means, but why start from this pinnacle—the highest in sight?

This can never be a satisfactory white man's country—*i.e.*, a country where he can do manual work alongside of and retain the respect of his black helpers.

The natural market for the produce of British New Guinea is, of course, Australia; but as yet the Customs in that protectionist country do not favour markedly its first-born colony.

If the Commonwealth insist on framing laws which keep alien labour out of this country, and thus raising cost of production, it is only reasonable to hope that it will allow that country some concession which will enable it to compete successfully with other countries where such handicaps do not exist. At present, when New Guinea produce—say, maize—is mentioned in Australia, the cry is, “Grown with black labour,” and its doom is sealed.

There are many products, coffee, cacao, cocoanuts, rubber, to mention a few which do not appear to be extensively cultivated in Australia. These would grow to perfection here. Why not make this Australia's tropical garden, where such products as require a large number of labourers per acre could grow, enter the Commonwealth free of duty, and compete with other countries whose produce pays a heavy tax?

The cost of living, if luxuries are eschewed, is not high. Fresh vegetables can be had if sufficient energy be put into gardening in suitable soil. In the



central division, at sea-level there are gardens, where beans, carrots, turnips, beetroot, &c., grow well; while on the hills, limes, oranges, papayas, &c., come to perfection.

Most people have "no time," or don't care, and prefer to struggle along with tinned apologies for these necessities. If one or two good Chinamen were allowed to start a market garden, they would make a great difference to those near them.

Fowls are practically unknown, and fresh beef one hears of but seldom sees. Good mutton is sometimes to be had in port, but more often than not the tinned delicacy known as "Bullemakow" is the *pièce de résistance*.

Society away from towns—nil. The natives have taken to cricket; and the astonishing spectacle of a frizzy-haired Papuan, clothed in a string, wicket-keeping as if to the manor born, is one that may be seen in almost every large coastal village.

Sport: For the sportsman there are strange and beautiful fish on the reefs where you look over the side into 20 ft. of water to see the bottom as clearly as if a yard away. In the estuaries the white Torres Strait pigeon roosts on the mangroves, and gives the most sporting of hard chances; or in the bush, where the pigeons and doves call all day long, one may shoot a tiny dove the size of a bulbul or a fat-crested goura, weighing 10 or 12 lb., and tasting better than the best turkey. Pigs roam the country, but are as shy and hard to find as deer. Those here are much smaller than the Ceylon pig, but seem as fierce and cunning when cornered as the biggest grim grey boar. Wallabies of sorts swarm in every acre of the low country, while one occasionally sees the track of some big cassowary or hears his sonorous call.

These notes are sketchy and incomplete, and have the additional disadvantage that they are from the writer's point of view—necessarily a limited horizon; but the ideas embodied are the result of much earnest discussion with those whose long residence in and knowledge of the country entitle them to speak with authority. The drawbacks to the intending planting investor of capital are:—

A Survey Department very much undermanned, and consequently in arrears of work. This means doubtful boundaries until block surveys are completed.

Unsettled labour laws, which means that the available labour is an unknown quantity. High wages for all labour, and high rates for goods to and from the country. Absence of roads, portending difficulties of land transport. Insufficient postal arrangements and a market of which the hospitality is, to say the best of it, doubtful. Conversely, the attractions, and they are not small, are a title to land which is indisputable; generous land laws; the finest soil that heart could wish for, growing magnificent timber. Soil that will grow any tropical product he takes the trouble to cultivate, every variety of climate, and as healthy a new country as one can hear of. With ordinary care and temperate living, his health here will be as safe as in any other rubber-growing part of the tropics.

One thing the intending planter can be sure of, the cordial assistance of every member of the Government. From His Excellency the Administrator down to the last-joined cadet every officer appears to look upon the planter as his especial *protégé*, and no service, no inconvenience, no discomfort is too great if by that means he can forward the planting industry in the slightest degree.

I take this opportunity of offering my most grateful thanks to those officers for their many acts of kindness and courtesy, and to assure them that but for their assistance my task would be a very different one and not the pleasure it is.

[Mr. Westland is managing director of the Papua Rubber Plantation Company in Papua. We have purposely omitted some of his remarks on coloured v. white labour.—Ed. "Q.A.J."]



## COCOA-NUT PLANTING IN SAMOA.

Copra forms by far the most important article of export from the Samoan Islands at present, says the "Agricultural News" of Barbadoes, although the shipments of 1907 (5,400 tons, valued at £77,981) fell far below those of the previous year. The price of the product, too, fell from £17 per ton in 1906 to £12 in 1907. Notwithstanding this, the British Consul at Samoa states that owners of land suitable for cocoa-nut cultivation are paying increasing attention to the industry, and the Government of the islands have for some years past required that each Samoan family shall plant at least fifty cocoa-nuts yearly on their land.

The following notes are taken from the latest report of the British Consul at Samoa:—

It is recommended that the holes in which the cocoa-nuts are to be planted should be about 2 ft. deep and correspondingly wide, and that they should be filled with a mixture of good soil and compost, ashes, a little salt, and, in cases where the soil lacks lime, some coral sand. The nuts should be covered with at least 3 or 4 in. of soil, and not be closer together than 33 ft., or about forty to the acre, or in the immediate neighbourhood of the sea they may be 30 ft. apart.

The crucial point is for the trees to have light and air on all sides, otherwise they will not bear well. Where forest trees are left standing in their neighbourhood, the growth of the cocoa-nut palms is much retarded and the yield lessened; and when even orange and other fruit trees overgrow and overshadow them, they do not thrive. According to the experience of some planters, trees growing 1 or 2 miles from the sea have a much smaller yield than those growing close to it, although this may not everywhere be the case.

It is stated by the authority mentioned above that the upward growth of the cocoa-nut palm in Samoa appears to be slower than in the coral islands of the South Seas, and especially New Guinea. But in place of this it appears to attain a greater age in Samoa, with unaltered yield. I was shown palms by one of the oldest planters in Samoa, which were still in full bearing, although they were reputed to be eighty years old. Such trees may certainly attain an age of a hundred years. The crowns of the palms in Samoa appear to me to be richer in leaves and much more compact than those of several parts of Kaiser Wilhelmsland.

The full-grown cocoa-nut plant is a bad neighbour to other plants, as its root system is uncommonly strong.

---

THE CANDLE-NUT TREE.

The Candle-nut Tree (*Aleurites triloba*) forms the subject of a paper in the "Agricultural Ledger of India," No. 4, 1907. This tree, which belongs to the natural order Euphorbiaceae, is not uncommon in the West Indies, and in Jamaica it is known as the "Country Walnut." The countries in which it is found growing in largest quantity, however, are Java, Sumatra, the Moluccas, and South Pacific Islands. It has also been naturalised in many parts of India and in Madagascar.

The fruit of the candle-nut tree is about the size of a small orange, and usually contains two heart-shaped seeds enclosed within hard shells. The seeds are interesting on account of the fact that they contain about 60 to 66 per cent. of a useful oil, which has a considerable market value. The candle-nut has received its name from the fact that the kernel burns like a candle when a light is applied to it, and in the South Pacific Islands the kernels are threaded on reeds and used as torches.



Of the 60 per cent. of oil contained in the seeds, about 55 per cent. is capable of being readily extracted on a commercial scale. This proportion is very high when compared with other oil-bearing seeds and nuts. Castor-oil beans yield no more than 40 to 45 per cent. of oil. The oil expressed from the nuts is known as Bankul oil or artists' oil. It is a drying oil, and is used in the arts for the same purpose as linseed oil—viz., in the manufacture of oil-colours, lacquers, and varnishes, and also for soap-making. The cake from which the oil has been expressed may be used as a cattle food or a manure.

Samples of candle-nuts have been submitted to brokers in London, who stated that the kernels should meet with a ready sale at £12 to £13 per ton.—“Agricultural News of Barbadoes.”

[The Candle-nut Tree has also been successfully acclimatised in Queensland.—Ed. “Q.A.J.”]

Times of Sunrise and Sunset at Brisbane, 1909.

DATE.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.42	5.40	6.20	5.57	5.46	7 Jan. ○ Full Moon 0 12 a.m.
2	4.57	6.46	5.22	6.41	5.41	6.19	5.58	5.45	15 „ ☾ Last Quarter 4 11 „
3	4.58	6.46	5.22	6.41	5.42	6.18	5.58	5.44	22 „ ● New Moon 10 12 „
4	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.43	29 „ ☾ First Quarter 1 7 „
5	4.59	6.46	5.24	6.40	5.43	6.16	5.59	5.42	5 Feb. ○ Full Moon 6 25 p.m.
6	5.0	6.47	5.25	6.39	5.44	6.15	6.0	5.41	13 „ ☾ Last Quarter 10 47 „
7	5.1	6.47	5.25	6.38	5.44	6.14	6.0	5.40	20 „ ● New Moon 8 52 „
8	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	27 „ ☾ First Quarter 0 49 „
9	5.2	6.47	5.27	6.37	5.45	6.12	6.1	5.38	7 Mar. ○ Full Moon 0 56 p.m.
10	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	15 „ ☾ Last Quarter 1 42 „
11	5.4	6.47	5.28	6.36	5.46	6.10	6.2	5.35	22 „ ● New Moon 6 11 a.m.
12	5.5	6.47	5.29	6.35	5.47	6.9	6.3	5.34	29 „ ☾ First Quarter 2 49 „
13	5.5	6.47	5.30	6.34	5.48	6.7	6.3	5.33	6 Apr. ☾ Full Moon 6 28 a.m.
14	5.6	6.47	5.30	6.33	5.48	6.6	6.4	5.32	14 „ ☾ Last Quarter 0 30 „
15	5.7	6.47	5.31	6.33	5.49	6.5	6.4	5.31	20 „ ● New Moon 2 51 p.m.
16	5.8	6.47	5.32	6.32	5.49	6.4	6.5	5.30	27 „ ☾ First Quarter 6 36 „
17	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.29	
18	5.9	6.47	5.33	6.30	5.50	6.2	6.6	5.29	
19	5.10	6.46	5.34	6.29	5.51	6.1	6.7	5.28	
20	5.11	6.46	5.35	6.28	5.51	6.0	6.7	5.27	
21	5.12	6.46	5.35	6.28	5.52	5.59	6.8	5.26	
22	5.12	6.46	5.36	6.27	5.52	5.57	6.8	5.25	
23	5.13	6.46	5.37	6.26	5.53	5.56	6.9	5.24	
24	5.14	6.45	5.37	6.25	5.53	5.55	6.9	5.23	
25	5.15	6.45	5.38	6.24	5.54	5.54	6.10	5.22	
26	5.16	6.45	5.38	6.23	5.54	5.53	6.10	5.21	
27	5.17	6.44	5.39	6.22	5.55	5.52	6.11	5.20	
28	5.17	6.44	5.40	6.21	5.55	5.51	6.12	5.19	
29	5.18	6.43	...	...	5.56	5.50	6.12	5.18	
30	5.19	6.43	...	...	5.56	5.48	6.13	5.17	
31	5.20	6.42	...	...	5.57	5.47	...	...	

## Entomology.

### DESTRUCTION OF THE PUMPKIN BEETLE.

Mr. H. Tryon, Entomologist and Vegetable Pathologist, has suggested the following measures for the suppression of the "pumpkin beetle" (*Aulacaphora punctata*):—

Treat the potatoes and pumpkins, &c., with Paris green, applied in the form of a fine spray, and not exceeding 1 lb. to 160 gallons of water. It must, of course, always be kept well stirred while in use, and should not be applied during rain, sunshine, or heavy drying winds; or to either fruit or vegetables within a month of the time of gathering.

Another good spray is made of white arsenic and lime in the following proportions:—White arsenic, 1 lb.; unslacked lime, 2 lb.; water, 3 gallons.

Slowly slack the lime, add the arsenic, put in the water, and boil for an hour. Add 160 gallons of water, and it is ready for use. Be careful to boil the mixture thoroughly, and if the lime is not of good quality increase the quantity.

I should advise, where practicable, the destruction of the beetles by shaking them into a bucket or pan containing a little kerosene or boiling water. Where they are feeding in great numbers, this would be a simple way of destroying considerable quantities, and be taking advantage of the habit this species has of feeding in company and suddenly dropping off the leaves when alarmed.

---

### INSECTS DESTRUCTIVE TO GRAIN IN BIN AND GRANARY.

The Assistant Entomologist of the Kansas, U.S.A., Experimental Station has issued a useful bulletin on "Insects Attacking Grain in the Stack, Bin, and Granary." He says:—

Of the twelve or thirteen species of beetles attacking stored grains, not more than five or six are commonly found at work in the farmers' bins. To these may be added four species of small moths, of which the Angoumois grain moth is the most serious pest attacking ripened corn, and the meal moth and the Mediterranean flour moth the serious ones in meal, bran, or any of the ground grain products. The farmer applies the term "weevil" to all of these insects, and distinguishes the moths by the term "fly weevil." All are of small size, none of the beetles exceeding  $\frac{5}{8}$ -in., and the most of them being less than  $\frac{1}{4}$ -in. long, reddish, black, or brown in colour. The moths are tiny "millers," and their work in the bins and granaries may be distinguished from that of the beetles by the presence of web or silk in the grain, bran, meal, or flour.

### METHODS OF CONTROL.

Measures to be employed in the control of this class of insects are both preventive and insecticidal.

**PREVENTIVE.**—To avoid infestation in the stack, the grain should be threshed as soon after harvesting as practicable. Fresh grain should not be exposed to attack by being placed in bins or granaries with that already infested. Before storing, the old grain should be removed and the floors, walls, and ceilings of the bins thoroughly cleaned. If the granary has been badly infested, it should be fumigated. Cleanliness is very important in preventing

•



injury by these insects. Dust, dirt, rubbish, refuse grain, flour, and meal serve as breeding places. Frequent agitation or handling of the grain will destroy many of these moths, because they are unable to free themselves from a mass of it, and perish in the attempt.

**INSECTICIDAL.**—Fortunately, it matters little what species may be causing the trouble, for all succumb to the same treatment. The simplest, most effective, and inexpensive remedy for all insects infesting the farmers' grain stored in tight bins is careful fumigation with carbon bisulphide.

*The Amount of Liquid to be Used.*—This depends upon the size of the buildings, on its tightness, and the nature of the attack. If the building is reasonably tight and the infestation slight, 1 lb. of carbon bisulphide is sufficient for every 700 cu. ft. of space, or 1 lb. for every 100 bushels of grain. In case the building or bins are not sufficiently tight to allow thorough fumigation, the amount of the liquid should be doubled or even tripled. If the insects are beetles, and are very abundant, the liquid should in every case be doubled.

*Preparation.*—The building and bins must be made as nearly air-tight as possible, in order that the vapour may remain in all parts of the space in full strength and for the required time. The vapour must enter all cracks and crevices by diffusion. The doors and windows should be arranged so they can be opened from the outside when fumigation is completed. Care should be taken to have everything ready and in its place, so that after the first vessel has received its liquid it will be unnecessary to stop to adjust anything. Everything should be done to avoid unnecessary delays and to facilitate the rapid evaporation of the liquid.

*Placing the Liquid.*—The liquid should be placed in shallow pans or dishes as high as possible in the bins or building, since the vapour is heavier than air, and settles to the lower parts. It should be well distributed, having not more than a half-pound in a place. In large bins, to hasten and equalise the operation, it is well to put a quantity of the liquid in the centre of the grain by thrusting into it a gas pipe, loosely plugged at one end, down which the carbon bisulphide may be poured and the plug loosened with a rod. The liquid may be applied directly in this manner to infested grains or seeds without injuring their edible or germinative qualities.

If a building of more than one floor is to be fumigated, the operator should begin on the first floor and work upward, and after placing the liquid in the second story leave the building through a window that he can close after him. If impossible to get out from the upper story, the carbon bisulphide should first be distributed there, working downward as rapidly as possible to avoid the settling vapour.

*Length of Exposure.*—The bins or building should be allowed to fumigate from 24 to 36 hours. The best plan usually is to apply the liquid on a Saturday afternoon, and leave the building closed until the following Monday.

*Ventilation.*—Doors and windows should be opened wide and the building or bins aired thoroughly one or two hours before entering. Slight traces of the odour will linger in corners and other places where the air does not move freely, but these will gradually disappear.

*Precaution.*—The vapour of this liquid is highly inflammable and explosive. No fire or light of any sort should be allowed about the building while the fumigation is in progress. The application should always be made in daylight, for artificial light of any kind is dangerous. Electric lights must not be used, since when turning them on or off there is always danger of producing a spark. Nor is it safe to have heat of any kind in the building while the fumigation is in progress.



## General Notes.

### ANOTHER DROUGHT PREDICTED.

Mr. Clement Wragge, who, while Government Meteorologist in this State, achieved a reputation for his accurate weather forecasts, and although at present on a lecturing tour in India, does not forget his old friends in Queensland, but occasionally gives them a friendly warning as to the future seasons. In March, 1906, he wrote to the London "Standard," foretelling another drought, and ended his letter as follows:—

"Now is the time for Australians to wake up and lock the rivers for water conservation and irrigation. Better so than trying to keep out the Japanese. For another Australian drought will attach to the next solar minimum after 1910 as surely as little apples fall in autumn. Laughing and ridicule will never alter fact, and Galileo's spirit will bear full witness."

A few weeks ago he returned to the charge, and has declared that the rainfall in Australia will now fall off, but he gives the comforting assurance that the coming drought will not be so severe as the last.

Will farmers and dairy farmers seriously consider the probability of another recurrence of the drought, which, owing mainly to the neglect to conserve the superabundant fodder of previous fat seasons, entailed such ruinous loss upon the improvident ones? The silo should be in evidence on every farm, and now is the time to prepare for the inevitable. By and by it will be useless to call upon Jupiter for help.

### EXTERMINATION OF SPARROWS.

With reference to the sparrow pest, Mr. R. B. Shackleton, Glass Mountains, writes:—

#### *Re* SPARROW EXTERMINATION.

I noticed with interest in Journal for November, pp. 254-5, remarks on this subject. You are possibly aware that in England the sparrow pest is becoming very acute, and various schemes for its riddance are being discussed in the "Times" and other papers. I enclose a cutting from "The Keighly News" (Yorkshire), which covers some very sensible remarks, and draws a conclusion which it would be well for us here to reflect upon. I always have held that Nature, if left fairly alone, will restore oft-needed balances.

Our humble friend, the ground cuckoo shrike, is one of Nature's weapons to rid us of what threatens to become a very serious infliction, just as the owl, the kestrel, and hawk tribes in England, if left alone, would do their work right well.

The paragraph from the Yorkshire journal is as follows:—

#### THE CAMPAIGN AGAINST THE SPARROW.

With the crusade against the rat we are fairly familiar, and most of us are quite ready to agree that there is something to be said for the proposal for diminishing his numbers. But the latest suggestion is to couple the sparrow with him, and to wage unceasing and merciless warfare against both. There has been a long correspondence in the "Times" on the subject, starting with a letter from a certain popular novelist, who told a doleful tale of the havoc wrought in field, garden, and orchard by these pertinacious little thieves, and culminating in a serious proposal for the institution of universal sparrow



clubs, and a demand for Government subsidies if it is found that the Englishman's love of killing something is not sufficient in itself to lead him to shoot sparrows fast enough. Having got thus far, however, those who had put forward this delightful little plan for getting rid of a feathered pest discovered that the sparrow still has a few friends. These, naturally, raised a protest against his wholesale destruction. A still larger number of people began to hint that, unless the knowledge of natural history kept pace with this proposed sharp-shooting practice, there would be a grave danger of our new crack shots indulging in an indiscriminate slaughter of the innocents of the feathered race in their anxiety to keep down the thievish and troublesome sparrow.

As for the more thoughtful members of the community who took the matter into careful consideration, they were not slow to point out the absurdity of trying to restore, by means of gunpowder, that balance of Nature which we have deliberately permitted to be upset. As a writer in the "Nation" says, if it be true that the sparrow has immensely increased in numbers it is not difficult to assign the reason. "England is becoming the playground of the rich, and their pleasures make the gamekeeper the chief arbiter in the survival of species. The gamekeeper has destroyed the owl, the kestrel, and the sparrow-hawk. The consequence is that rats and sparrows multiply." The cheapest and most sensible remedy for the plague of sparrows about which we have been hearing so much of late is not to engage in a universal shooting campaign against these little creatures, but to stop the shooting campaign which has been so long in progress against the hawk, the kestrel, and the owl. Nature will do the rest, and will do it more effectually and intelligently than forty thousand subsidised sparrow clubs could.

### SPARROW-DESTROYING BIRD.

In the November issue of the Journal we made reference to a bird which was said to attack and destroy sparrows. Since then a letter has been received by Mr. Thos. Hardy, the well-known South Australian vigneron, from Mr. J. W. Mellor, honorary secretary of the South Australian Ornithological Society, in which he says:—

"Re the notice of bird-destroying sparrows in New South Wales, as per Government Agricultural Gazette. The bird, Ground Cuckoo Shrike (*Pteropodocys phasianella*) is nearly allied to the *graucalus* family, a species of which is common here—viz., the Black-faced Cuckoo Shrike (*Graucalus melanops*), commonly known as the slaty doves, blue doves, &c., on account of the slaty-blue colour predominating in the plumage. The family is chiefly insectivorous, and useful birds in agricultural districts. They will eat berries a little, but not to the extent of doing harm. The nest is shallow, and composed of web and fibres woven together on a horizontal fork of a tall tree. They lay only two eggs, of olive-green colour, spotted with brownish spots; but the ground variety has eggs of more uniform light olive-green colour. Being only two in a clutch, the increase is somewhat limited. The ground cuckoo shrike is found right through the interior of Southern Australia, from New South Wales to South Australia; but we do not see the bird so far south as Adelaide. I am somewhat sceptical as to its 'killing' propensities with the sparrow. It may worry a bit, but that at most. I should like to have more evidence relating to this new departure in its life history before making it a fixed habit. The bird needs to be studied closely in its natural haunts before coming to any conclusion. The birds are naturally migratory. Other species here generally depart during the winter, returning about Christmas time, and are sometimes called Christmas birds on that account. They are totally protected in South Australia. A few stay with us at the Redbeds and breed. I do not know whether the ground variety would go down South, for they have not come down of their own accord, although the way is quite



open to them. Care needs to be exercised in introducing birds, for fear of their attacking our small native birds, in addition to sparrows, and so doing more harm than good. A responsible person should be got to look after their habits before making any step of introduction, &c., and I would advise the collection of data from the districts where the bird breeds, as it is here that the true propensities generally exist."

### HOW TO VANQUISH THE MOSQUITO.

An American paper says that a very simple and perfectly effective method of destroying mosquitoes is to make use of permanganate of potash. Two and a-half hours are required for the development of the full-grown mosquito from the larva. It can be instantly killed either in its infancy, or at maturity, by contact with minute quantities of this chemical. A solution of the salt, containing only 1 part in 15,000 of water, distributed in swamps and water-holes where mosquitoes breed, will render the development of the larvæ impossible. A handful of permanganate will oxidise a 10-acre swamp, kill all its embryo insects, and keep it free from organic matter at a cost of 25 cents (12½d.) An efficacious method is to scatter a few crystals wide apart. A single pinch of permanganate has killed all the germs in a 1,000-gallon tank. The above is from "The Public Health Journal," U.S.A.

Some years ago we noticed large numbers of mosquito larvæ in a small waterhole at Nundah. A few months later none were to be found in it, but by some means or other (probably by the help of birds or cattle, carrying fish spawn on their feet), this waterhole became alive with tiny brilliantly-coloured fish, about 2 in. long. Doubtless these little fish destroyed the larvæ. Confirmation of this theory, we now find in an article in the London "Times," republished in the "Journal of the Jamaica Agricultural Society," for September, 1908. It is as follows:—

"It has long been known that Barbados is the only West Indian island that is absolutely free from malaria and from the presence of the anopheles mosquito. Major Hodder, R.E., in his report to the War Office three years ago on the drainage works that were then being carried out in St. Lucia, came to the conclusion that there was some hitherto undiscovered reason why the anopheles failed to propagate its kind in Barbados, where the culex was abundant. It appeared from his observations that the anopheles could, or did, only breed on the ground level; none of its larvæ being found in tanks which were raised a few feet from the earth, nor even in those which were actually resting on the ground. The culex can, on the other hand, breed in the gutters on the roofs of high buildings as easily as in the low-lying swamps and pools. My friend Mr. C. Kenrick Gibbons, who had given a good deal of attention to the matter, pointed out at once that all the pools and swamps in this island were stocked with swarms of a tiny fish (known locally from their vast numbers as 'millions'), and that their favourite food was the larvæ of the mosquito. It is obvious that any species of that insect which is unable to breed above the ground level must fall a prey to this enemy. The fish has been identified by Mr. Boulenger, F.R.S., of the British Museum, as *Girardinus pocciloides*. Some specimens were successfully got to England, and flourished for some time in the insect house at the Zoological Society's Gardens. Mr. Gibbons' suggestion that the 'millions' should be imported into malarial districts in other islands has been acted upon, and with felicitous results. For instance, the Country Health Board of Antigua, 'being convinced of the useful part played by these fish in consuming mosquito larvæ, have arranged for their systematic distribution throughout the ponds and streams of the island.' Similar news comes from Jamaica, whither a consignment of the fish was sent in November, 1906. The secretary of the Agricultural Society writes that the tanks at the Titchfield Hotel are full of them, and that



he had been informed that there had been a marked diminution of fever round about, the 'millions' evidently accounting for the mosquito larvæ. They have also been sent to Colon and to British Guiana. One cannot help wishing that these useful little fish were given a trial in the deadly districts of Africa. Like the malarial mosquito, the insects which convey the terrible diseases which are endemic there pass the larvæ stage of their existence in water. One may add in this connection that the Swedish consul at Frankfort has discovered a small fish ('the blue-eyed') which feeds on mosquito larvæ, and that, at the request of the Italian Government, some are to be, or have been, sent to the Campagna, where so much has been done in recent years to diminish malaria."

To this, the editor of the Jamaica journal above mentioned adds:—

In many of our streams and ponds here, the same little fish called "millions" in Barbados and "ticky-tickies" here are found, and many people have used them in their tanks. The consignment mentioned as having been got from the Barbados was closely examined, and the "millions" found to be identical with our "ticky-tickies." Tanks are very favourite breeding places for mosquitoes, and we are afraid it is only a few who appreciate the necessity of preventing the mosquitoes breeding—for their own comfort and well-being. We are glad to draw the attention of every reader to this fact, that the little "ticky-tickies" live on the larvæ of mosquitoes, and that in districts subject to these insects, and where tanks and ponds are used, this little fish should be put in these. This does not, however, do away with the fact that mosquitoes breed wherever a little stagnant water collects, and care should be taken to prevent this as far as possible, by cleaning these places with kerosene.

The "Tropical Agriculturist," Ceylon, takes the following suggestion from the "Madras C. C. Magazine":—

A trap for catching mosquitoes has been devised by Mr. Maxwell Lefroy which is simple and effective. It consists of a small box, about 12 in. square and 9 in. wide, with hinged lid which has a small orifice with a sliding cover. The box is lined with dark-green baize, and has a tin floor. The trap is placed in a shady corner of the room, and the mosquitoes, when they enter the house in the morning, seclude themselves in it to escape the sunlight. The lid is then shut, and a teaspoonful of benzine injected into the box. Mr. Lefroy found that in a short time the mosquitoes succumbed, and by continuing this process for a month caught and killed over 2,300.

### PLANTS IN BEDROOMS.

It is generally believed that it is unhealthy to keep plants and flowers in bedrooms. This may be true, observes the "Mouvement Industriel," in the case of flowers, owing to their perfume, but a green plant, on the contrary, improves the air of a room. Consequently, a living plant increases the amount of vapour necessary for constitution of the air. From the point of view, of health, then, it would be advisable to keep a number of green plants in rooms, especially when heated. In addition to purifying the air by contributing moisture to it, they enliven the view and help the sick to support the *ennui* of confinement.

### A CODLIN MOTH PARASITE.

The South Australian "Journal of Agriculture" says that a worm has been discovered which infests the grub or caterpillar of the codlin moth, and which may prove of some service in the battle against that great pest of our apple and pear trees. Mr. A. F. Furniss, of Mount Lofty, when removing the bandage from an apple-tree in his orchard, found that some of the grubs had died before the cocoon was completed. Mr. Quinn, the Horticultural Expert, placed the dry remains of the grub in distilled water, and found inside it two thread-like

worms, which returned to life in the liquid, and one of which measured over 6 in. in length when unwound. Specimens of the worm were sent to Mr. W. W. Froggatt, the Government Entomologist of New South Wales, for identification, and Mr. Quinn, who is attending the Australasian Fruitgrowers' Conference in Melbourne, has taken further specimens to show to the entomologists at that gathering. There seems no doubt that a parasitic worm is destroying some of the hibernating caterpillars of the codlin moth, but its life history and the amount of aid which it can give towards combating the pest are matters for investigation.

### A WATER-WEED CUTTER.

Mr. J. Plummer, Lane Cove River, Sydney, sends the following extract and illustration of a new water-weed cutter, taken from the "British Trade Journal." The saw, as it is called, would doubtless do good work in canals, ponds, and streams unencumbered by sunken timber, but we should doubt its efficacy in our streams and waterholes infested by water hyacinth, owing to the number of snags which are found in such places.

The apparatus consists, as the accompanying illustration shows, of a flexible saw, which is weighted at certain points, a few feet apart, by torpedo-shaped sinkers. At each end of the saw is a clamp to which is fastened, by means of a short length of stout wire, a cross handle. The saw is lowered into the water, and then the weed cutting is carried out by two persons, one at each end, who move the saw backward and forward about a yard each way. The teeth of the saw work against the stems of the weeds, which as they are severed float away. The saw can be had in two grades—the stout,  $\frac{5}{16}$  in. wide, and the ordinary,  $\frac{1}{4}$  in. wide. Ten yards of the stout saw weigh 10 oz., and the whole apparatus, complete with four sinkers and the two end clamps and wire attachments, weighs under 10 lb., and costs a comparative trifle. The apparatus is extremely simple, and very little labour and no skill are necessary to work it. As the saw itself is flexible, it accommodates itself to any height

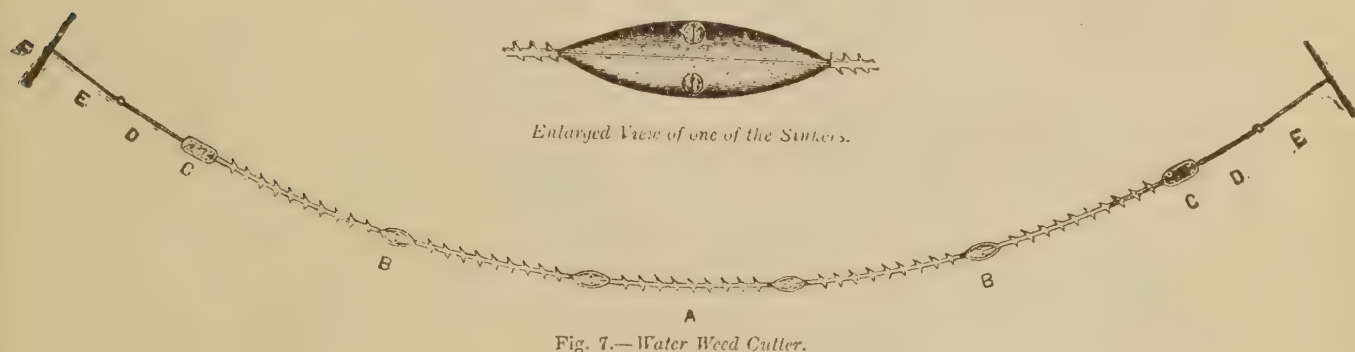


Fig. 7.—Water Weed Cutter.

or slope of the banks, or to the inequalities at the bottom of the stream or lake. Such an appliance will be of great value in all districts where it is necessary to keep ponds, lakes, and rivers free from weeds in connection with fishing, boating, mill-driving, &c." Further particulars and prices can be had from Mr. Jackson at the address above given.



## Answers to Correspondents.

### TO MEASURE THE QUANTITY OF WATER AVAILABLE IN A STREAM.

CANE-GROWER, Lower Burdekin.—

There are several methods of measuring the quantity of water. They all resolve themselves into arrangements for estimating what engineers call the cubical content of a certain vessel, which is filled and emptied in a certain time, or the cubical measurement of water passing over a certain weir, placed for the purpose, and whose dimensions have been exactly measured. It should be mentioned that the weight of any quantity of water is easily found from its cubical measurement. Thus, 1 cu. ft. of water weighs  $62\frac{1}{2}$  lb. If, therefore, the number of cubic feet of water passing a given spot in a given time can be measured, the quantity of water available is known at once. But the number of cubic feet may be always obtained by measuring the number of feet and inches of any given body, say a given body of water, every way. Thus, if we have a body of water lying in a trough, the dimensions of the trough being, say, 1 ft. wide, 6 in. high, and 2 ft. long, and the trough is filled and emptied, say, 100 times in a minute, the quantity of water passing through the trough per minute will be 100 cu. ft., or 100 times  $62\frac{1}{2}$  lb., or 6,250 lb. One method of measuring, therefore, is to place a trough of known dimensions in the path of the stream to be measured, making sure that the whole of the stream has to pass through the trough, and taking the time for some object—say, a chip of wood—to pass through the trough. If the chip of wood takes one minutes passing from one end of the trough to the other, it is evident that the trough is emptied in one minute. If the chip takes one second only, the trough is filled and emptied sixty times per minute, and so on. A more usual method is, a temporary weir is formed, by the aid of a piece of wood, so arranged that the whole of the water must pass over the weir. In the board forming the weir a notch is cut, which may be conveniently of rectangular form. That is to say, the two sides of the notch will be perpendicular, both the same height, and the bottom of the notch will be horizontal, and parallel with the top of the board. The notch cut in the board should not be longer, measured across the stream, than two-thirds of the total width of the stream. Thus, if the stream is, say, 3 ft. wide, the notch in the board should not be more than 2 ft. wide. The notch should be bevelled on the side away from the stream, so that the water may flow over it easily. That is to say, the top of the notch should be made wedge-shaped.

#### HOW TO MEASURE.

In arranging for the measurement of the water, a pond should be formed above the dam, containing an appreciable quantity of water, so that when it is allowed to run over the weir it will not flow too rapidly, as if it is allowed to do so the measurement obtained will be higher than it should be. The pond above the weir should be practically still, and the water should flow very gently, with hardly any perceptible motion at all, over the notch. It is also important that the bottom of the notch, the sill over which the water flows, should be exactly level, and that there should be from 8 in. to 10 in. of water between the bottom of the pond and the bottom of the notch. By measuring the rate at which a chip of wood thrown into the stream at any distance above passes down over the weir—that is to say, the time that it takes passing over a certain length of the stream—and multiplying this by the area of the notch, the quantity passing per minute may be obtained, in a similar manner to that described with the trough.

Where neither of these plans is convenient, the rate at which the stream flows may be measured, without damming it at all, by taking definite lengths of the stream, at different parts, and observing the time that a chip of wood occupies in passing over the given lengths. It is usual to take only four-fifths of the rate of flow of the stream obtained by this method, because the water on the surface always flows faster than that below. The depth and width of the stream are then averaged as carefully as possible. The width of the stream is measured in a number of places, being careful to take the actual width at the bottom, not that at the surface, where the bank often slopes. And the depth of the stream is taken by a pole marked in feet and inches, also at a large number of places. For both the width and depth the measurements taken are all added together and divided by the number of measurements, the result being the average width and depth. Thus, taking the measurements of the width of the stream as, say, 6 ft.,  $5\frac{1}{2}$  ft.,  $6\frac{1}{2}$  ft., 7 ft., and  $3\frac{1}{2}$  ft., the total of the six measurements is 33 ft., and that divided by six, the number of measurements, is  $5\frac{1}{2}$  ft., and this would be taken as the average width of the stream. Similarly, the whole of the measurements of the depth of the stream would be added together and divided by the number of measurements, and that would be taken as the average depth. Taking the width as  $5\frac{1}{2}$  ft., and the average depth as 1 ft., if the rate of flow was 10 ft. per minute, when corrected, as described above, for the difference between the flow on the surface and below, the average quantity of water flowing per minute would be 55 cu. ft., and the average weight per minute would be 55 times  $62\frac{1}{2}$  lb.—3,437 $\frac{1}{2}$  lb.

If you turn to the January issue of the Journal for 1903, you will find a full account of irrigation work in your district. In the June issue for the same year there is an article on the proposed irrigation of the Woongarra Scrub from the Elliott River.

The above method is given by Mr. S. F. Walker in "The Farmer and Stock Breeder."

#### THE DARLING PEA.

J. R. CAGNEY, Avondale, Boolburra.—

Mr. Sydney Dodd, Principal Veterinary Surgeon and Bacteriologist, to whom your letter and specimen plant were submitted, says:—The specimen forwarded by you on the 31st ultimo is what is known as the Darling Pea or Indigo Plant. Its poisonous properties are well known in Australia, especially among sheep, and the symptoms you describe as occurring in your colt are those which are attributed to this plant when eaten by horses. Mr. Bailey, the Colonial Botanist, in his article on "Plants Reputedly Poisonous to Stock," states that numerous cases have been recorded where the plant has poisoned horses, and the symptoms of the disease coincide with your description.

#### CASSAVA AS A FOOD STUFF.

W. INGLES NOTT, Westwood.—

At the Florida (U.S.A.) Experimental Farm cassava was proved to be the best and cheapest ration which can be used for fattening purposes. As to the comparative cost between cassava and maize, the difference was two-thirds in favour of the former.

Both varieties—sweet and bitter—contain hydrocyanic poison. In the sweet, the poison is in the skin; in the bitter, it is in the skin and juice. If fed to pigs as dug the animals will be poisoned; 1 gr. of prussic acid will kill a human being, 16 gr. will kill a horse; and some quantity between these two will kill a pig. On some lands sweet cassava will turn to bitter. The change



results from planting on a free level soil cuttings from plants grown on hilly stony land. The very productive variety known as "Mexico" is very apt to change in this way. To be safe, the tubers should be peeled and boiled before being fed to stock.

To determine how the material can be treated to render it safe as a stock food, Professor Carmody made a number of experiments (see "Queensland Agricultural Journal," Vol. XII., January, 1900). Treated with cold water for twenty-four hours, the amount of hydrocyanic acid left in the sliced green roots was 1.134 gr. per lb. Treated with cold water for twenty-four hours, water poured off, and treated with a second lot of water for another ten hours, the residue of poison was .301 gr. These were young roots. When old roots were treated with boiling water for nine hours, and the water poured off, no poison was left in the roots. It was thus shown that by treatment, as above shown, the roots can be rendered quite safe for food purposes.

Hydrocyanic acid is a very volatile poison, and if the roots are sliced and left for a time in the sun, then most of the poison is driven off. Tubers and cuttings may be obtained from the Kamerunga State Nursery, Cairns, on application to the Instructor in Tropical Agriculture, Mr. H. Newport. Plant in spring.

#### COTTON FROM NORMANTON.

W. HUTSON, Vanrook Station, Normanton.—

The sample of cotton sent by you to the Colonial Botanist is an excellent sample of Caravonica silk cotton. It is worth 2d. per lb. in the seed at Brisbane.

---

# The Markets.

## PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.						NOVEMBER.
						Prices.
Apples (Hobart), per case	...	...	...	...	...	13s. to 14s.
Apples (American), per case	...	...	...	...	...	12s. to 16s.
Apples (Cooking), per case	...	...	...	...	...	9s.
Apricots, per quarter-case	...	...	...	...	...	2s. 6d. to 3s. 6d.
Asparagus, per dozen bundles	...	...	...	...	...	5s.
Bananas (Cavendish), per dozen	...	...	...	...	...	2½d.
Bananas (sugar), per dozen	...	...	...	...	...	1½d. to 2d.
Cherries, per case	...	...	...	...	...	6s. to 8s.
Grapes, per case	...	...	...	...	...	3s. to 4s.
Lemons (Italian), per case	...	...	...	...	...	30s. to 32s.
Lemons (Italian), per half-case	...	...	...	...	...	16s. to 17s.
Lemons (Sydney), per case	...	...	...	...	...	12s. to 13s.
Mangoes, per case	...	...	...	...	...	2s. to 4s.
Oranges, per case	...	...	...	...	...	5s. to 7s.
Passion Fruit, per quarter-case	...	...	...	...	...	1s. 6d. to 1s. 9d.
Papaw Apples, per quarter-case	...	...	...	...	...	1s. 6d. to 2s.
Peaches, per quarter-case	...	...	...	...	...	2s. 6d. to 3s. 6d.
Pears, per quarter-case	...	...	...	...	...	4s. to 5s.
Pineapples, rough, per dozen	...	...	...	...	...	2s. to 2s. 6d.
Pineapples, smooth, per dozen	...	...	...	...	...	3s. to 4s.
Plums, per quarter-case	...	...	...	...	...	3s. 6d. to 4s.
Rock Melons, per dozen, according to size	...	...	...	...	...	4s. to 7s.
Strawberries, per dozen boxes	...	...	...	...	...	2s.
Tomatoes, per quarter-case	...	...	...	...	...	1s. 3d. to 1s. 6d.
Water Melons, per dozen, according to size	...	...	...	...	...	8s. to 9s.

### SOUTHERN FRUIT MARKET.

Apples (Tasmanian) eating, per case	...	...	...	...	...	5s. to 15s.
Apples (Tasmanian) cooking, per case	...	...	...	...	...	5s. to 10s.
Apples, American, per case	...	...	...	...	...	12s. to 15s.
Apricots, per box	...	...	...	...	...	4s. to 7s.
Bananas, Queensland, per case	...	...	...	...	...	14s. to 15s. 6d.
Bananas, Queensland, per bunch	...	...	...	...	...	3s. 6d. to 5s. 6d.
Cherries, per quarter-case	...	...	...	...	...	2s. 6d. to 7s.
Gooseberries, per quarter-case	...	...	...	...	...	3s. to 4s.
Guavas (Cherry) per quart	...	...	...	...	...	6d.
Lemons, per case	...	...	...	...	...	10s. to 16s.
Mandarins, per case	...	...	...	...	...	8s. to 15s.
Mandarins, Special Emperor, per case	...	...	...	...	...	20s. to 25s.
Nectarines, per case	...	...	...	...	...	6s.
Oranges (Local), per case	...	...	...	...	...	10s. to 12s.
Oranges, Navel, per case	...	...	...	...	...	14s. to 15s.
Passion Fruit, choice, per quarter-case	...	...	...	...	...	5s. to 7s.
Passion Fruit (medium), per quarter-case	...	...	...	...	...	2s. 6d. to 4s.
Passion Fruit (small), per quarter-case	...	...	...	...	...	2s.
Peaches, China, per half case	...	...	...	...	...	6s. to 8s. 6d.
Pears, American, per case	...	...	...	...	...	16s. to 18s.
Pineapples, Queensland (common), choice, per case	...	...	...	...	...	6s. to 10s.
Pineapples (Ripley Queen), per case	...	...	...	...	...	6s. 6d. to 10s. 6d.
Pineapples (Queen's), per case	...	...	...	...	...	8s. to 10s.
Plums, per gin case	...	...	...	...	...	6s.
Rock melons (Queensland), per case	...	...	...	...	...	4s. to 5s.
Strawberries, choice, per dozen quart punnets	...	...	...	...	...	7s. to 9s.
Strawberries, good, per dozen quart punnets	...	...	...	...	...	4s. to 6s.
Tomatoes, Queensland, choice (coloured), per quarter-case	...	...	...	...	...	5s. to 7s.
Tomatoes, Queensland, good, per quarter-case	...	...	...	...	...	2s. 6d. to 3s. 6d.
Water melons, Queensland, per crate	...	...	...	...	...	20s.



# PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR DECEMBER.

Article.								DECEMBER.	
								Prices.	
Bacon, Pineapple ...	...	...	...	...	...	...	lb.	9d. to 10½d.	
Barley, Malting ...	...	...	...	...	...	...	ton	£5 10s.	
Bran ...	...	...	...	...	...	...	lb.	10d. to 1s.	
Butter, Factory ...	...	...	...	...	...	...	ton	£5 10s.	
Chaff, Mixed ...	...	...	...	...	...	...	ton	£4 10s. to £4 12s. 6d.	
Chaff, Oaten ...	...	...	...	...	...	...	ton	£4 15s. to £6 5s.	
Chaff, Lucerne ...	...	...	...	...	...	...	ton	£4 10s. to £5 10s.	
Chaff, Wheaten ...	...	...	...	...	...	...	lb.	5d. to 5½d.	
Cheese ...	...	...	...	...	...	...	ton	£9 15s.	
Flour ...	...	...	...	...	...	...	ton	£7 to £7 10s.	
Hay, Oaten ...	...	...	...	...	...	...	ton	£3 10s. to £4 10s.	
Hay, Lucerne ...	...	...	...	...	...	...	lb.	2¼d. to 2½d.	
Honey ...	...	...	...	...	...	...	bush.	4s. 1d. to 4s. 2d.	
Maize ...	...	...	...	...	...	...	ton	3s. 9d. to 4s. 3d.	
Oats ...	...	...	...	...	...	...	ton	£6 10s. to £6 15s.	
Pollard ...	...	...	...	...	...	...	ton	£5 to £7 10s.	
Potatoes ...	...	...	...	...	...	...	ton	...	
Potatoes, Sweet ...	...	...	...	...	...	...	ton	...	
Pumpkins ...	...	...	...	...	...	...	bush.	4s. 6d.	
Wheat, Milling ...	...	...	...	...	...	...	ton	4s. 11d.	
Wheat, Chick ...	...	...	...	...	...	...	ton	£6 10s. to £7.	
Onions ...	...	...	...	...	...	...	lb.	1s. 0½d. to 1s. 1½d.	
Hams ...	...	...	...	...	...	...	doz.	9½d. to 1s. 1½d.	
Eggs ...	...	...	...	...	...	...	pair	2s. 6d. to 5s. 1d.	
Fowls ...	...	...	...	...	...	...	pair	...	
Geese ...	...	...	...	...	...	...	ton	3s. 4d. to 4s. 6d.	
Ducks, English ...	...	...	...	...	...	...	ton	5s. to 7s.	
Ducks, Muscovy ...	...	...	...	...	...	...	ton	8s. to 8s. 6d.	
Turkeys (Hens) ...	...	...	...	...	...	...	ton	13s. to 26s.	
Turkeys (Gobblers) ...	...	...	...	...	...	...	ton	...	

## ENOGGERA SALEYARDS.

Animal.								NOVEMBER.	
								Prices.	
Bullocks ...	...	...	...	...	...	...	...	£9 15s. to £12 2s. 6d.	
„ (single) ...	...	...	...	...	...	...	...	£7 10s. to £8	
Cows ...	...	...	...	...	...	...	...	£9 5s.	
„ (single) ...	...	...	...	...	...	...	...	20s.	
Merino Wethers ...	...	...	...	...	...	...	...	18s. 6d.	
C.B. „ ...	...	...	...	...	...	...	...	14s. 9d.	
Merino Ewes ...	...	...	...	...	...	...	...	19s.	
C.B. „ ...	...	...	...	...	...	...	...	14s. 9d.	
Lambs ...	...	...	...	...	...	...	...	...	
Pigs (bacon) ...	...	...	...	...	...	...	...	...	
Pigs (slips) ...	...	...	...	...	...	...	...	...	

## Farm and Garden Notes for February.

**FIELD.**—The land intended for potatoes should now be ready for planting. Plant sound small potatoes, well shot, without cutting them. If large potatoes are cut into setts, there is a risk of their rotting, as the usual wet weather may be expected, with a hot, muggy atmosphere. Weeds will be very troublesome, and for that reason the sowing of lucerne should be deferred till later. Sow lucerne in deep rich soil, thoroughly worked, and deeply ploughed. Cape barley, panicum, Kafir corn, imphee, sorghum, and vetches may be sown, but it is risky to plant maize for a late crop, as early frosts would destroy the ripening grain. For an early winter crop sow swede turnips and mangelwurtzels.

**KITCHEN GARDEN.**—Make preparations for good crops of vegetables for the early winter by ploughing or digging all unoccupied land, supplying well-rotted manure if needed. Chicken guano is also an excellent fertiliser, if prepared as follows:—

Spread a layer of black soil on the ground. Dump the fowl manure on to this, and pound it fine with the back of a spade; add hardwood ashes, so that the compound shall contain—Soil, 3 bushels; fowl manure, 2 bushels; ashes, 1 bushel. Mix thoroughly, and a little before planting moisten the heap with water, or, better still, with urine; cover with old mats, and let it lie till needed.

Most market gardeners will have cabbages and cauliflowers ready for transplanting. Do this during the month. Read the article in the December number of the Journal issued by this Department (1907); also in the pamphlet on "Market Gardening," on the growing of cabbages and cauliflowers, in which it is recommended to sow the seed from the middle of January to the middle of March, arranging the time, however, to suit early and late districts. For winter crops the Drumhead type, of which Flat Dutch and Queensland or Florida Headen are good examples, are the most profitable. The Savoy cabbage does well here. The best cauliflowers to grow are the Large Asiatic, Eclipse, Early Dwarf, and Le Normand. If the aphid appears, spray with tobacco solution.

Sow French beans, butter beans, beet, carrot, turnip, radish, cabbage, cauliflower, cress, peas. Should the weather prove dry after the January rains, give the plants a good soaking with water. Gather all fruit of cucumbers, melons, French and other beans, and tomatoes as they ripen, to ensure the continued production of the vines and plants.

**FLOWER GARDEN.**—Thin out and tie up dahlias. Keep the weeds down, and never allow them to seed. Sow hardy annuals. This is the best month for sowing, as you will be able to keep up a succession of bloom during the succeeding months of autumn and winter. To ensure this, sow phlox, pansy, daisy, stocks, aster, nasturtium, hollyhocks, candytuft, mignonette, sweet peas, dianthus, carnations, cornflower, summer chrysanthemums, verbenas, petunias, pentstemons, &c. Dianthus, sown now and planted out in March, will bloom during the whole year if the dead stalks and blooms are regularly cut away.

Do not sow flower seeds too deep, as on the depth will depend greatly what results you will have as regards the seed germinating. It is easy to remember that seeds should be covered with fine soil to a depth equal to their own size—for instance, a pea is about one-eighth of an inch in diameter, therefore, cover it with one-eighth of an inch of soil.



## Orchard Notes for February.

By ALBERT H. BENSON, M.R.A.C.

In order that the series of monthly notes that have appeared for some years past in the "Agricultural Journal" might be rendered of more value to our fruit-growers, I took advantage of the commencement of the new year of 1908 to revise them and bring them up to date. At the same time, I somewhat altered the notes, as, instead of making them of a general nature, applicable to the whole of the State, I endeavoured to localise them to a certain extent, as, in my opinion, although the general principles of cultivation, manuring, pruning, treatment of fruit pests, as well as of the handling and marketing of the fruit are applicable to the State as a whole, there are many matters that are of interest to individual parts of the State rather than to the whole State; and, further, notes that are applicable to the Southern part of the State for one month are not always applicable to the North for the same month.

In order to carry out this idea I divided the State as follows:—

1. The Southern Coast Districts, south of the Tropic of Capricorn;
2. The Tropical Coast Districts;
3. The Southern and Central Tablelands.

This plan has met with such general approval during the past year that the notes will henceforth be published in accordance therewith.

### THE SOUTHERN COAST DISTRICTS.

The earlier summer fruits, including grapes, will be pretty well over, but pineapples, mangoes, and bananas are in full fruit. The bulk of the main summer crop of pines ripens during the month, and growers are in consequence kept very busy sending them to both our local markets and canneries, and to the Southern States. The planting of all kinds of tropical fruits can be continued where necessary, though earlier planting of both pines and bananas is to be recommended. Still, if the land is thoroughly prepared—viz., well and deeply worked—they can be planted with safety, and will become well established before winter. The month is usually a wet one, and both tree and weed growth is excessive. If unable to get on the land with horses to keep down weed growth, use the scythe freely in the orchard before weeds seed, as by doing so you will form a good mulch that will tend to prevent the soil washing, and that when ploughed in later on will add a considerable quantity of organic matter to the soil, thus tending to improve its mechanical condition, its power of absorbing and retaining moisture, as well as to increase its nitrogen contents.

This is the best month of the year in which to bud mangoes in the Brisbane district. The bark of the stock to be budded must run very freely, and the scion, when placed in position, must be tied very firmly. The bark of the scion should be slightly thicker than the bark of the stock, so that the material used to tie it keeps it firmly in its place. As soon as the bud is tied ringbark the stock just above the bud, so as to force the sap of the stock into scion so that a union will take place quickly.

Where cyaniding of citrus and other trees has not been concluded it may be continued during the month as fruit treated now will probably keep clean and free from scale insects till gathered. If the trees have been treated with Bordeaux mixture, do not cyanide, as cyaniding should always be done previous to spraying with Bordeaux mixture.

If Maori is showing, spray with the sulphide of soda wash. Look out for Black Brand and also for the Yellow Peach Moth towards the end of the month in the earlier districts. Spraying with Bordeaux mixture is advisable in the case of both of these pests.

Get land ready for strawberry planting, so as to be ready to set out runners next month. Some growers set out plants as early as the end of February, but I prefer March. Citrus and deciduous trees can still be budded during the month. Young trees in nursery should be kept clean and attended to; ties should be cut where necessary, and the young trees trained to a straight single stem.

#### THE TROPICAL COAST DISTRICTS.

As the month is usually a very wet one in this part of the State, very little work can be done in the orchard other than keeping down excessive weed growth by means of a scythe. When citrus trees are making excessive growth and throwing out large numbers of water-shoots, the latter should be cut away, otherwise they are apt to rob the rest of the tree, and thus injure it considerably. Many of the citrus trees will come into a second blossoming during the month, and this will produce a crop of fruit ripening towards the end of winter and during the following spring. The main crop, where same has set in spring, will be ripening towards the end of the month, but as a rule insect life of all kinds is so prevalent at this time of year that the bulk of the fruit is destroyed. Where there is sound fruit, however, it will pay to look after. If the weather is wet it should be artificially dried before packing, but if there are periods of sunshine, then the fruit can be cut and laid out on boards or slabs in the sun, so that the extra moisture of the skin can be dried out. Care will have to be taken not to sun-scald the fruit, or to dry it too much; all that is required is to evaporate the surplus moisture from the skin, so that the fruit will not speck when packed.

Tropical fruits of all sorts can be planted during the month. Budding of mangoes and other fruits can be continued. Bananas must be kept netted, as fly is always bad at this time of year.

#### THE SOUTHERN AND CENTRAL TABLELANDS.

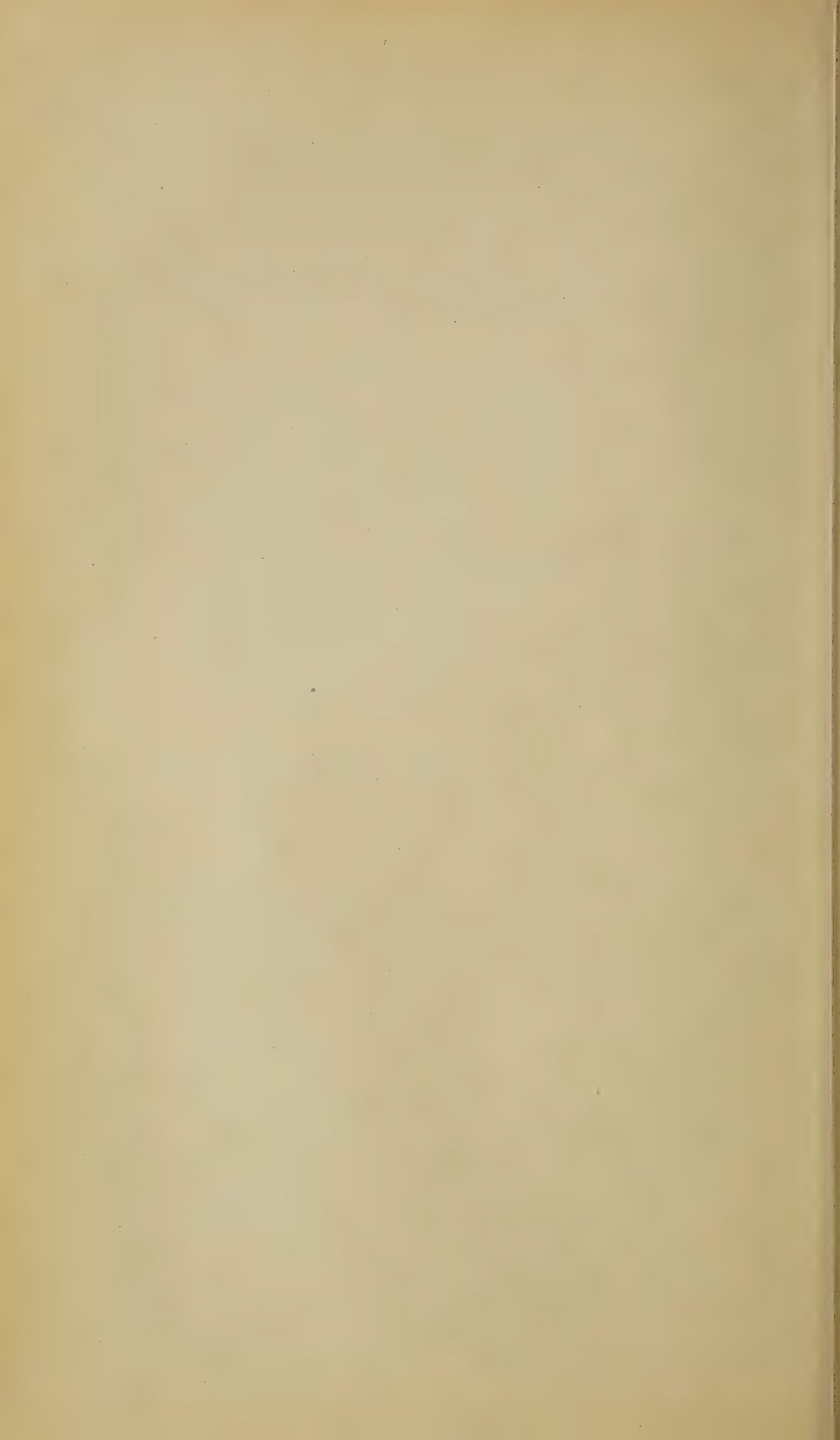
The marketing of later varieties of apples, pears, plums, peaches, and nectarines will occupy the attention of the Stanthorpe growers. The grape harvest will also extend right through the month. Every care should be taken to see that the fruit fly and codling moth are not allowed to spread, although the best work in fighting these pests has to be done during the months of December and January, as on the action then taken, if carried out systematically, the freedom of the later fruits from infestation mainly depends.

Handle the fruit carefully, and see that no fly or codling moth infested fruit leaves the district. The grapes, ripening as they do when this fruit is over in the earlier parts of the State, should be sent not only to Brisbane but to all other parts of the State. For long shipment nothing can beat crates holding 6-lb. baskets. The fruit should be gathered some hours before packing, and be placed in the sun, so as to become thoroughly dry, and to allow the stems to become wilted, as this causes the fruit to hang on the bunch much better, and consequently to reach its destination in better order.

If parrots and flying foxes are troublesome, organised shooting parties or poisoning with strychnine are the best means of dealing with those pests.

The crop of grapes will be about over in the Roma and other inland districts. Citrus trees, when infested by Red Scale, should be cyanided. The orchard should be kept well cultivated after every rain, and when there is no rain, but water is available for irrigation, if the soil requires it, the trees should get a good soaking, which, if followed by thorough cultivation, will carry the trees on till the fruit is ripe.





VOL. XXII., PART 2.

[FEB, 1909.]

Registered at the General Post Office for Transmission by Post as a Newspaper.]

---



THE  
QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOL. XXII. PART 2.

---

FEBRUARY.

---

By Authority:

BRISBANE: ANTHONY J. CUMMING, ACTING GOVERNMENT PRINTER.

1909.



## CONTENTS.

AGRICULTURE—	PAGE.
Sorghum Poisoning ... ..	55
Lucerne-growing ... ..	55
Onion Mildew ... ..	59
Teeswater Sheep ... ..	59
Arrowroot-growing in Queensland ... ..	59
Crops at Hermitage State Farm—Season 1908 ... ..	60
DAIRYING—	
The Tuberculin Test—Is it Dangerous? ... ..	62
Regulations under “ <i>The Dairy Produce Acts, 1904 to 1905</i> ” ... ..	63
Angora Goats ... ..	65
The Dairy Herd—Queensland Agricultural College, Gatton ... ..	68
TO CRYSTALLISE FRUITS ... ..	68
THE HORSE—	
Clipping Horses ... ..	69
Horses not Lying Down ... ..	69
Glenthorne Monarch ... ..	71
FORESTS OF JAPAN ... ..	71
POULTRY—	
The Marketing of Poultry ... ..	72
Common Sense in the Poultry Yard ... ..	74
Old Hens ... ..	77
In-breeding ... ..	77
THE ORCHARD—	
Grapes for Export ... ..	79
Cork Waste ... ..	82
New Bordeaux Mixture ... ..	83
Fruit Cases ... ..	83
Beating the Fruit Fly ... ..	83
A New Mango ... ..	84
THE MARKET FOR FIBRES ... ..	84
APICULTURE—	
Australian Honey in England ... ..	85
Bee Notes ... ..	85
SERICULTURE—	
Eri Silk ... ..	86
STATISTICS—	
Rainfall of Queensland ... ..	87
HORTICULTURE—	
Flower Gardening, No. 13 ... .. The Editor	88

	PAGE
CEMENT FROM SOAP WASTE ... ..	93
TROPICAL INDUSTRIES—	
Sisal Hemp in German East Africa ... ..	94
Picking Cotton ... ..	94
Subsidiary Crops for Cane Farmers ... ..	95
Kapok ... ..	97
Experiments with Rubber Seeds ... ..	98
The Pessou Cane Harvester ... ..	99
CUT WORMS ... ..	99
VEGETABLE PATHOLOGY—	
Nematode Root Gall ... .. H. Tryon	100
A NOVEL MOUSE TRAP ... ..	102
ANIMAL PATHOLOGY—	
Acute Tympanites (Hoven, or Blown) ... S. Todd, F.R.C.V.S.	103
Garlic for Tick Fever ... ..	104
GENERAL NOTES—	
Marvels of Cultivation ... ..	105
Cure for Tick Poison ... ..	105
Re-inforced Concrete ... ..	106
Rat Poisons ... ..	107
Sweet Potato Weevil ... ..	107
Hot Bearing ... ..	108
TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1909 ... ..	108
ANSWERS TO CORRESPONDENTS—	
To Bore a Hole through Glass ... ..	109
Kapok ... ..	109
Boring Insects ... ..	109
Underground Tank ... ..	109
Chopped Sugar-cane as Fodder ... ..	110
Failure of Potato Crop ... ..	111
THE PUMPKIN BEETLE ... ..	111
THE MARKETS—	
Prices for Fruit—Turbot-street Markets ... ..	112
Southern Fruit Market ... ..	112
Prices of Farm Produce in the Brisbane Markets for January ...	113
Enoggera Saleyards ... ..	113
FARM AND GARDEN NOTES FOR MARCH ... ..	114
ORCHARD NOTES FOR MARCH ... .. A. H. Benson, M.R.A.C.	115
LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES ... ..	I.
DEPARTMENTAL ANNOUNCEMENTS ... ..	VII.
DIRECTIONS FOR FORWARDING SPECIMENS ... ..	VIII.



NOTICE.

Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,  
to cover postage.

To all other persons the annual subscription will be 10s., which will include postage.

All remittances should be made by postal notes or money orders, but where they are unobtainable stamps will be accepted, though the Department accepts no responsibility for any loss due to the latter mode of remitting.

For your convenience an Order Form is attached. A cross on each side of the Order Form indicates to the recipient that his subscription is again due.

Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

ORDER FORM.

To the Under Secretary, Department of Agriculture  
and Stock, Brisbane.

For the enclosed\*.....please  
forward me THE QUEENSLAND AGRICULTURAL  
JOURNAL for One Year.

Name.....

PLEASE WRITE PLAINLY. Address.....  
.....

Occupation.....

\* State amount according to above rate.

## Agriculture.

### SORGHUM POISONING.

We have at various times published articles in connection with sorghum poisoning, and, in them, have pointed out how the ill effects of green sorghum on stock can be minimised or entirely prevented. About April, 1908, the "Journal of Agriculture" of Victoria contained an article contributed by the chief veterinary officer of the State on the danger of feeding green sorghum (also known as Guinea corn and millet) to cattle, and from the particulars given it would seem that the risk of poisoning, which is due to prussic acid contained in the plant, is in an inverse ratio to the vigour of the growing crop, since prussic acid is found present in increased quantity in stunted crops and during dry seasons, while it is almost absent in the case of plants that have grown quickly on moist land. Second growths, which are usually inferior in quantity and quality, are also stated to be more dangerous than first crops. The amount of prussic acid present in the plant is also largely increased as the result of heavy dressings of nitrogenous manures.

The prussic acid is present in dangerous amount only in certain stages of growth, from five to seven weeks usually, and gradually disappears shortly after the blossoming stage when the ears begin to form. By the time the seed is ripe the poison has completely disappeared.

Green sorghum should be fed only in small quantity, and never when in an immature state. If the plant is put in the sun to dry after cutting, the danger quickly disappears, since prussic acid is a volatile compound.

With reference to the above remarks, "The Agricultural News" of Barbados says:—

"It may be mentioned that prussic acid does not occur in the free state in the growing plant, but is yielded by a glucoside present, when the latter compound is acted upon by an enzyme or ferment also occurring in certain parts of the plant. The amount of glucoside present, and therefore the possible amount of prussic acid that may be formed, diminishes as the plant approaches maturity.

"Earlier experiments appeared to indicate that, on drying the sorghum in the sun, the plant lost its possibly poisonous properties. Later experiments, however, carried out at Melbourne, and in the laboratory of the Government of India, have shown definitely that this is not the case, and that the glucoside present is unchanged by sun-drying."

---

### LUCERNE-GROWING.

The rapid expansion of the dairying industry in Queensland has naturally caused great attention being paid to experiments with several varieties of fodder grasses. In some countries where the industry takes precedence of all other farming pursuits—Wisconsin, for instance, in the United States of America—enormous sums are annually paid by dairy farmers for high protein feeds, such as oil-meal, oil-cake, cotton-seed meal, bran, &c., with which to balance the feed ration. Of the fifty million dollars (£10,000,000) brought in to the farmers for milk products annually, a very large proportion, in cash, labour, and time, is expended in purchasing and carting these feeds and, necessarily, the farmers lose a large portion of what would otherwise be profit.

Under these circumstances, they turned their attention to fodder grasses, and amongst these lucerne—or, as it is called in America, alfalfa—was found to



be the best of all feeds for farm animals, including swine and poultry. No single forage plant contains the materials for a profitable ration for dairy cows, sheep, and swine in the same degree as lucerne.

On a station farm near Madison, lucerne has been grown for several years successfully, says Mr. R. A. Moore, of the Agricultural Experiment Station of the University of Wisconsin, and many tests made to determine the best method of growing it under different conditions of soil and climate. When grown in comparison with red clover, timothy, and brome grass during the season of 1904, the yield per acre of hay was 5·4 tons for alfalfa, 2·5 tons for clover, 2·3 tons for timothy, and 1·3 tons for brome grass. As a green forage the weight of alfalfa grown per acre was double that of clover, three times that of timothy, and five times that of brome grass. The per cent. of protein found in the hay was as follows:—18·7 for alfalfa, 13·28 for clover, 4·74 for timothy, and 6·07 for brome grass. In total yield of protein per acre alfalfa produced three times that of clover, nine times that of timothy, and twelve times that of brome grass.

The abundant root development of lucerne, and the great depth to which the roots extend when once established, enable the plant to secure food and moisture several feet below the surface. On the station farm lucerne that had been seeded one year had main roots extending to the depth of 3 ft., and, where seeded for three years, had roots extending to the depth of 5 ft. Lucerne is said to extend its roots to the depth of 20 ft. and over, and is regarded as one of our greatest soil renovators.

Good growths of lucerne are often secured in favourable seasons on level land, but better results will be obtained on land that is somewhat sloping, where water will not stand during any portion of the year. "Patchy fields" are hard to renew, and generally necessitate reploughing and reseedling. In no case should lucerne be sown on land that is subject to overflow, or where the water level is but 2 or 3 ft. below the surface. Lucerne will grow on a wide variation of soil, ranging from a rich sandy loam to a heavy clay, but a rich clay loam over a gravelly subsoil seems to be best. It is practically useless to try to grow lucerne on sandy or "worn-out" soils without an abundant supply of good barnyard manure.

In the coast districts of Queensland, lucerne thrives best on alluvial flats and pockets on the banks of the creeks, where the lands are periodically fertilised by the overflow from the streams. Lucerne is a deep-rooter. It strikes down to a depth of 15 ft., and even from this depth continues to descend until it meets a hard subsoil or clay, which the roots cannot penetrate. When the plant reaches this stage it is at a standstill. Deterioration shortly afterwards begins to manifest itself, and the plant loses its vigour. Lucerne will hold fairly good for ten years. After this space of time the natural grasses begin to show, and the lucerne dies out. Land in which it is intended to plant lucerne requires good cultivation, and should be thoroughly mixed; three crops, at least, of maize or wheat should be taken off the ground prior to the sowing of the lucerne seed. These croppings cause the land to be worked thoroughly, and enable the agriculturist to rid the paddocks of all natural grasses, including couch and nut grasses, which are the deadly enemies of lucerne. If these are allowed to remain, the lucerne will not thrive, but will die out in a short time.

On the rich lands of the Darling Downs and on the plains in the Lockyer district, lucerne thrives to perfection.

The following instructions for growing this crop are intended more for the benefit of new settlers than for those farmers who have for many years been successful growers of this invaluable stand-by of the dairy farmer:—

"The best land for lucerne is a deep alluvial soil, such as that on the banks of many of our rivers and creeks. If this is not procurable, the next best is that of the deep black soils of the plain country of the Darling Downs and other parts of the State. Shallow land, or land having a hard, retentive



clay subsoil or hard-pan, should be avoided, as the lucerne plant is a deep rooter and requires a deep soil for its full development. No land is well adapted for lucerne-growing unless it contains a sufficient quantity of lime, as the presence of this plant-food is essential to its growth.

"**PREPARATION OF THE LAND.**—Plough the land deeply some months before the seed is sown, so as to get it into the right condition. That means that the whole furrow must be brought into a state of fine tilth, so that when the seed germinates the young roots will be able to at once strike down deeply into the soil.

"**SOWING.**—The best time to sow the seed is from the middle of March to the end of April, as this enables the lucerne to get a good roothold before the winter sets in, and thus be able to withstand the effects of the frost.

"The drill is undoubtedly the best machine with which to sow the seed, as by its means the seed is more evenly distributed over the land than by hand sowing. From 10 lb. to 20 lb. of seed is usual per acre.

"I believe in sowing the seed through the coulter, not by means of a broadcast drill, as the seed is thereby placed at an even depth and, consequently, comes to the surface more regularly. It is a good plan to attach a light wooden harrow to the drill so as to smooth the land behind the drill, and to follow this by rolling as soon after as possible.

"If the seed is sown in autumn, the lucerne will, in an ordinary season, be fit to cut for hay in September. Lucerne is best sown by itself, as the presence of stubble or other rubbish, which is always present when the seed is sown with wheat or oats, is thus avoided.

"**AFTER CULTIVATION.**—Once lucerne is established, say in twelve months after seeding, it is a difficult matter to over-cultivate it. The spring-tooth harrow or disc harrow is a grand implement to run through the lucerne after each crop is taken off, but if this is not always practical there must be at least one cultivation every spring. The more lucerne is cultivated the better it grows.

"**HARVESTING.**—The best time to cut lucerne for hay is just when the first blossom is showing. The great mistake which most of our lucerne-growers make is in allowing the lucerne to get too far advanced before cutting.

"**GRAZING.**—The great trouble in grazing lucerne is, that sheep and cattle are very liable to what is termed "blowing," but this can be overcome to a great extent by not letting the stock on to a paddock until the lucerne is 6 or 7 in. high. Once on lucerne, let the stock stay there, and, if this precaution is taken, my experience has been that there is practically no danger from "blowing."

"**LUCERNE FOR SEED.**—When lucerne is being grown for seed, the plants should be at least three years old, as it is not advisable to take off a crop of seed till the plants have reached full maturity, and become thoroughly established. A dry season is far better for getting a crop of seed than a wet one.

"The best time to cut lucerne for seed is when the lower pods are quite ripe and the upper pods are just turning brown.

"Cut with an ordinary mower, taking care to remove the crop as cut out of the way of the horses by having one or two men to follow the mower for this purpose. A sidedelivery reaper, or a reaper and binder without string binding attachment, can also be used.

"When cut allow it to become thoroughly dry before stacking, or, better still, if machinery is available, thresh at once from the field, without stacking.

"The ordinary wheat-threshing machine is suitable for threshing lucerne—in fact, it answers the purpose very well, with a little alteration.

"**YIELD.**—The yield of seed per acre varies from 50 to 400 lb. per acre, which, provided all weather conditions are favourable, is a good paying crop, but the risks are great, as at least two good crops of hay have to be sacrificed to get one crop of seed."—W. D. LAMB, Yangan.



Sometimes the land becomes what is known as *lucerne sick*. This is owing to the land having been too long under lucerne. In such a case a two-years' rest is needed. The land may either be fallowed for one season, and a crop of potatoes or corn taken off in the following season, or green fallow the land for two years, taking one crop of some cereal each year.

Some thirty-five years ago a disease, or rather a harmful parasite, of the lucerne plant was introduced from New South Wales. This was the "Dodder" (*Cuscuta australis*). It is a kind of hair-like vine which creeps up the lucerne stems, twines round them, and, by means of small suckers or rootlets, feeds on the sap of the plant. If allowed to spread, the field rapidly assumes the appearance of having been attacked by ringworm. The main root of the dodder dies, but its tendrils spread in a circular form, leaving the lucerne in great yellow circles. The remedy is at once to dig out the lucerne so affected the moment it is noticed. Great care is required in removing it, as the least particle of dodder, if dropped elsewhere in the field, will grow. The bare patches should be sprayed with sulphate of iron. The solution should contain as much sulphate as a cask of water will take up. The lucerne and dodder should be removed and burnt, or even burnt on the spot, which is then to be watered with the liquid. Mr. J. Whitely, of Wycarbah, recommends first to destroy the lucerne and dodder by fire, and then to mulch the spot heavily (say 4 to 6 in.) with dry grass. This effectually chokes the dodder, but the lucerne will grow through it. When required to be mown, the mulch should be removed. It is not at all necessary by adopting this plan to dig up the lucerne roots.

The cost of preparing the land, of seed, and sowing will reach about 25s. per acre, and no further expense is entailed, once the field is established, for several years.

#### LUCERNE HAY-MAKING.

It may seem superfluous to write on this subject, seeing that for years farmers all over the coastal and Downs districts have been growing lucerne, and thoroughly understand the art of saving the crop. There are, however, many new beginners who have never had anything to do with hay-making, and a few words to put them on the right track may be of service to them. Every farmer knows that the whole success in hay-making lies in properly saving it. The first thing is to know when it is most advantageous to cut the crop for hay. The proper time is when the plants are just coming into bloom. Lucerne is one of those crops which suffer considerably by age, and if allowed to grow a couple of weeks after the plants are one-third in blossom, there will be a marked diminution in the total weight of crop as well as in the digestible food. Care should be taken, as far as possible, to mow when the weather bids fair to keep fine. After mowing it should lie in the field for a day or longer if the weather is cool. Lucerne must be very gently handled in order to prevent the loss of leaves, as it is on its leafiness that its market value depends. If rain should come on just after mowing, it is well to make small cocks, and spread the hay out again as soon as the rain has ceased. A better way, if the rain continues, is to put the lucerne at once into the silo. This will save the whole cut crop, whereas it would be rendered valueless if exposed to continuous heavy rain in the field. In our hot summer climate, a day is sufficient for the cut lucerne to lie on the ground. It should then be raked together, and cocked for another day or two, when it may be carted to the stack. Lucerne hay should be made quickly to avoid loss of leaves and colour. When stacked, do not be in too great a hurry to market it in bale form. Let it remain until it has finished sweating. If pressed too soon, it becomes musty or mouldy, and as a consequence the market price is depreciated. There is no difficulty in making lucerne hay, provided that the proper moment for cutting is chosen, that the weather be reasonably fine, and that care is taken in handling the hay.



## ONION MILDEW.

This troublesome parasite, which is to be found in all countries where the onion is grown, is caused by a fungus, a near relation of the dreaded potato-blight. All members of the onion family are subject to attack, the leaves being the organs which are directly affected. The first signs of disease consist of the development of yellowish patches on the leaves. These areas soon become covered with a delicate coating of mould, much as if they had been powdered with flour. This coating soon changes to a grey or light-brown colour. Meanwhile the disease increases rapidly until the whole leaf is affected and withers away. The appearance of "thick neck" is especially characteristic of this disease. The bulbs are not directly attacked, but if the disease appears early in the year they remain extremely small, and do not mature properly, so that the crop is practically ruined.

There are two methods of reproduction—first, by summer spores, which serve to disseminate the disease from crop to crop during the growing season; and, secondly, by rounded thick-coated bodies, called resting spores, which are produced in the decaying tissues of the leaves, and remain dormant throughout the winter. In the spring they germinate, and inoculate the young crop.

*Treatment.*

The crop should be thoroughly sprayed with Bordeaux mixture, using the 4-4-40 formula as a preventive. If this has been neglected, then spray as soon as the disease is detected. This spraying should be repeated whenever the disease appears to be gaining ground. The use of potassium-sulphite—1 oz. to 2 gallons of water for small plots, as it is more easily prepared than Bordeaux mixture, although not quite so reliable—is recommended.

*Bordeaux Mixture.*

4 lb. sulphate of copper; 4 lb. fresh lime (if fresh lime is not obtainable use 5 lb. of ordinary washing soda instead of 4 lb. of lime); 40 gallons of water.—"New Zealand Farmer."

## TEESWATER SHEEP.

The old Teeswater breed of sheep was the largest in England (says "The Live Stock Journal"). Four-year-olds were killed, which weighed 55 lb. per quarter, and even more. Mr. Thomas Hutchinson, of Stockton, an eminent breeder and grazier, killed at Christmas, 1779, a wether which scaled 17 st. 11 lb. (14 lb. to the stone), with 17 lb. of tallow. This, says Culley, was the heaviest sheep by several pounds per quarter he ever heard of. The animal was of the "true old Teeswater breed," which was famed for its mutton. These sheep were not kept in large flocks, and could not thrive on poor ground, and the practice was to depasture them in small numbers in small enclosures of the best grass. The enclosures were well sheltered, and the sheep had access to a stack of hay in the winter. The Teeswater ewes were prolific breeders. Mr. Edw. Eddison possessed one which, in the six years 1772-77, produced twenty lambs, the first nine in eleven months!

## ARROWROOT-GROWING IN QUEENSLAND.

Mr. Henry Lane, James street, New Farm, writes:—

"I was greatly interested in reading your article under above heading in the January number, and I have been thinking that you might accept a few notes from me.

"Permit me to say that, although not mentioned in H. N. L.'s reminiscences, I was one of the pioneers in the arrowroot industry in Queensland,



where, in the early seventies of last century, I carried on operations in a small way at my farm at North Pine. When I exhibited in Brisbane, without any competition, Governor Cairns, who, prior to his term in Queensland, was Governor of The Bermudas, and, as he himself said, knew arrowroot when he saw it, bestowed upon my product the highest praise, remarking that he had never seen it excelled, even in the West Indies.

"Encouraged by Governor Cairns' encomiums, I prepared an exhibit for the Great International Exhibition at Philadelphia, in 1876, when, in competition with growers from all parts, including The Bermudas, I was awarded medal and diplomas of the highest value, testifying to the superiority of Queensland-grown arrowroot.

"These awards—which I prize very much—I have had framed for preservation, and shall be pleased to show to any interested reader.

"I also exhibited with success in England in the eighties, but unfortunately lost my English certificates in the 1893 flood.

"The arrowroot I sent to St. Bartholomew's Hospital, London, was esteemed most highly, the faculty there giving my product the most unstinted praise, whilst, for a small shipment marketed for me in England by my late friend, Mr. Schwabe, I obtained the satisfactory return of 2s. 9d. per lb.

"I may mention that, like Major Boyd, in his interesting experiments, my appliances were of the crudest and most primitive type, yet I succeeded in demonstrating what can be done successfully in the arrowroot industry, which I claim should figure well up in the products of our State.

"As to returns, it is the old old story, which to our shame has to be acknowledged—viz., that, when it was seen that the article commanded such high prices and good returns, shipments were faked, as has been the experience in butter, honey, and other products. As regards the arrowroot market in London, the business was pretty well ruined by a large shipment from Brisbane, which was found to be heavily loaded with the flour of sweet potatoes.

"I am now in my 83rd year, and not in the running; could I but put back the shadow on the dial, I would endeavour to show our younger generation, with all their incalculable advantages, how to capture the arrowroot market of England, as well as to grip the local starch business.

"If any person going into arrowroot-growing cares to call upon me, I shall be pleased to give him the benefit of my experience and advice."

#### CROPS AT HERMITAGE STATE FARM, SEASON 1908.

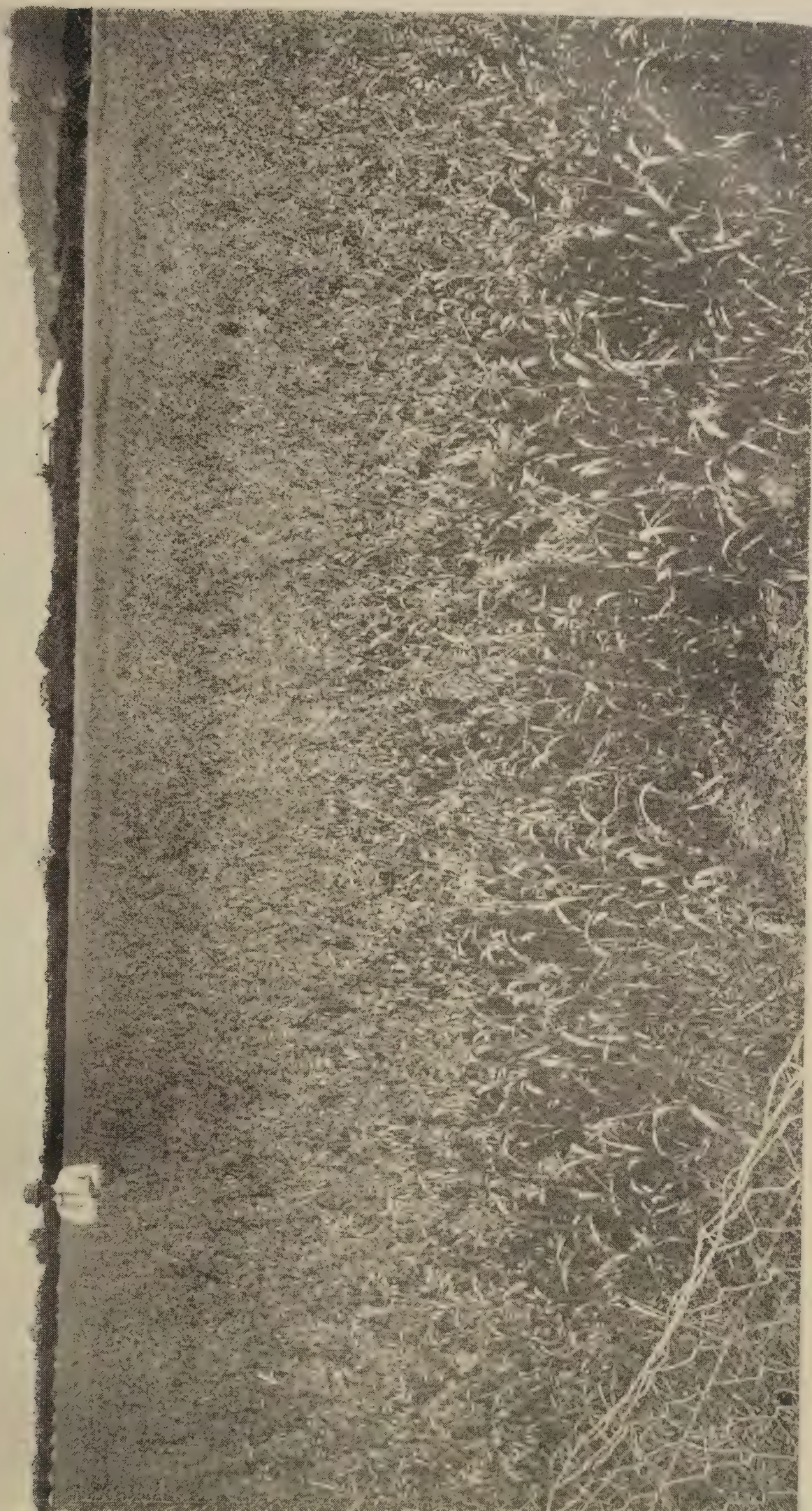
*Sixty-day Oats.*—Several years ago a small sample packet of this cereal was imported from America, to which place it had been introduced from Russia by the Bureau of Plant Industry, an organisation devoted to the selection of seeds and plants from foreign countries.

The variety was described as specially drought resistant. Its chief value lies in its hardness and the excellence of the plant for making a fine quality of hay. It is quick in maturing, but the name "sixty day" is a misnomer. The grain is thin and light, and not suitable for a feed oat.

*Kubanka Wheat.*—A bearded macaroni type, which owes its introduction to America from Russia, and was imported several years ago into Queensland. The hardness and drought-resistant qualities of this wheat have been cited by American authorities as the chief factors in admitting of the extension of their wheat-growing belt into arid regions. It is not to be wondered at that particular attention has been paid to the selection of prolific types. From time to time these improved strains have been imported into Queensland for trial.

After several years of tests on the Downs, and latterly in the Maranoa, it is evident there are many wheats in the State superior to macaroni types as drought-resisters; furthermore, the beard is most objectionable to handle in





CROP OF SIXTY-DAY OATS, HERMITAGE STATE FARM.







*Plate X.*



HERMITAGE STATE FARM.

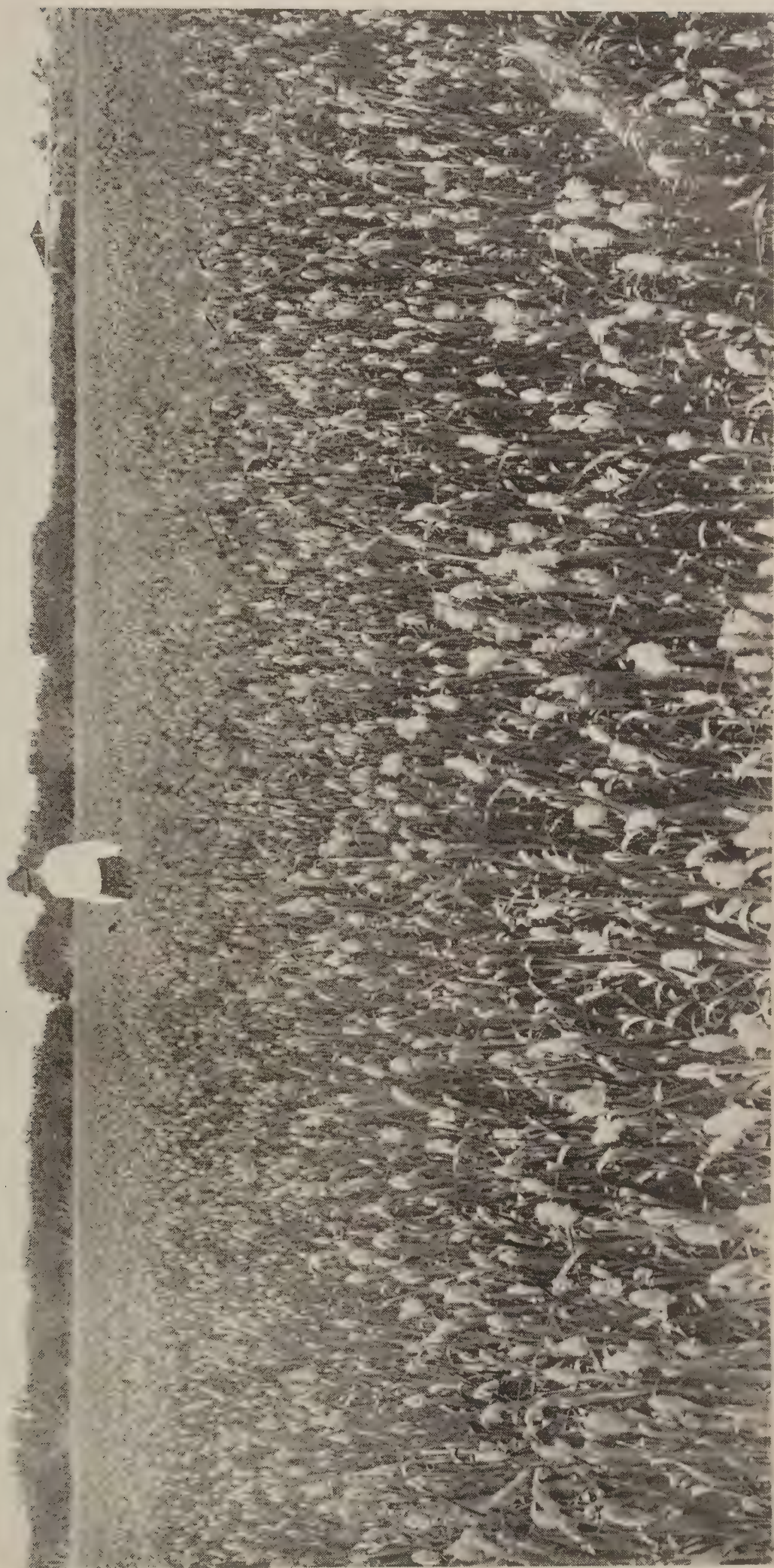
1. Plot of Pratt's Comeback Wheat.
2. Plot of Kubanka Macaroni Wheat.







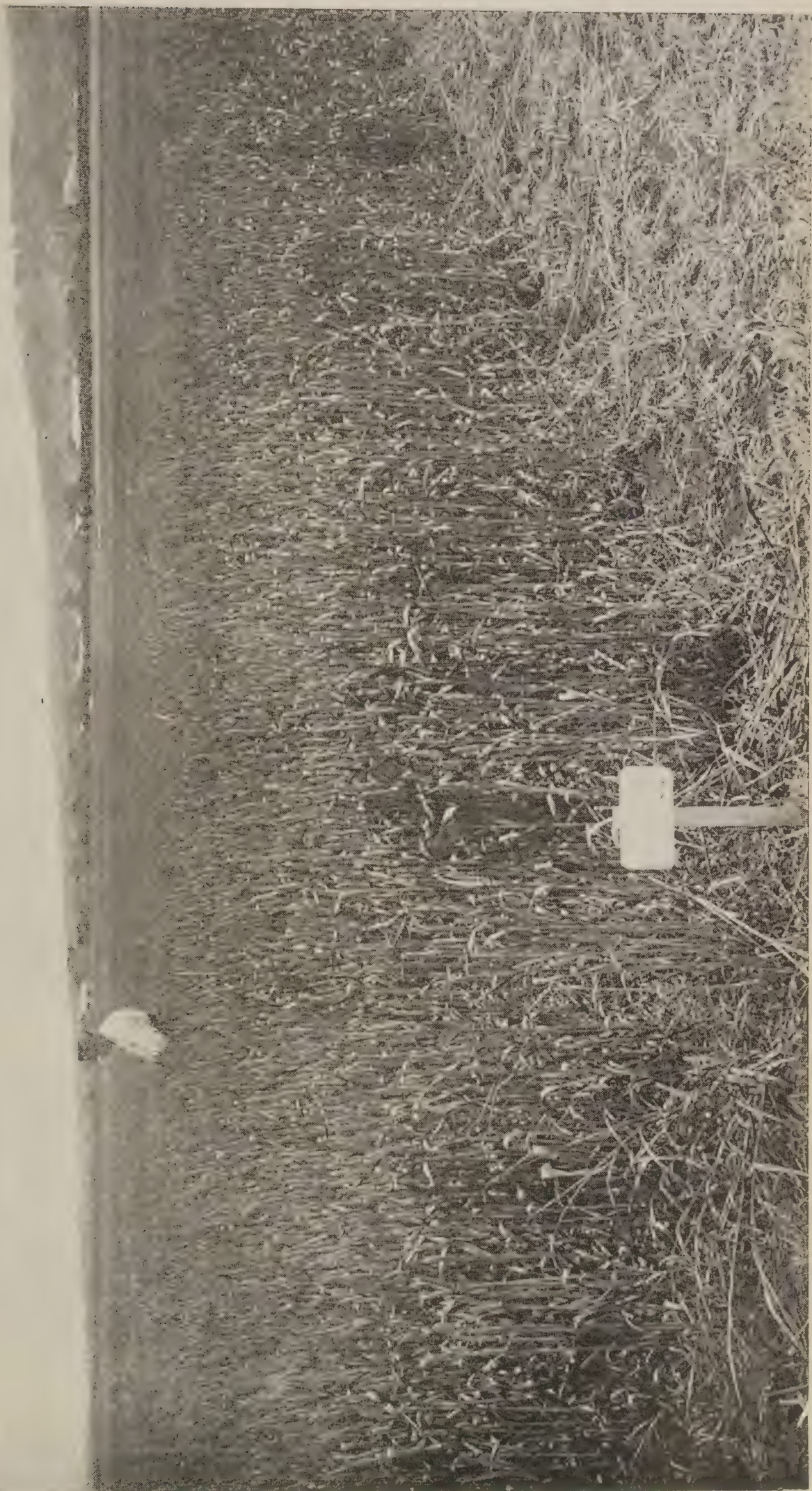
*Plate XI.*



CROP OF CANARY SEED, HERMITAGE STATE FARM.







FIELD PLOT OF No. 52, SOUTH AUSTRALIAN WHEAT, AT HERMITAGE STATE FARM.







FIELD CROP OF POTATOES, HERMITAGE STATE FARM.





harvesting and threshing. Until such time as a demand springs up for macaroni wheat, there is nothing to be gained by growing it, except on the coast, for poultry feed.

*Canary Seed.*—This crop is worthy of being included as an adjunct to wheat-growing on the Downs, as, with a little alteration of the same machinery which deals with wheat may be adapted to handle canary seed.

The period of seeding and harvesting is identical with wheat, with this advantage: That canary seed ripens a little earlier.

The plant makes good green feed, and is valuable for hay-making. Its immunity to rust and fungoid diseases offers a greater reliability of return.

*Pratt's Comeback.*—The crop shown in the illustration was raised from seed secured in South Australia. It resembles certain types of wheat raised by the late William Farrer, of Queanbeyan.

It has an attractive-looking straw and an early habit. Observations have not been extensive enough to determine its value as a rust-resister, but during the present season it has come away and ripened early enough to escape the visitation. The straw, when ripening, appeared to lose its vitality to a certain extent.

*No. 52* (Sown 20th June, 1908).—This, together with several other wheats, distinguished for the present by numerals, is being grown over a series of seasons at Hermitage to assist the Department of Agriculture in South Australia to arrive at certain conclusions, after comparisons are made with identical varieties grown in the several States of the Comonwmealth.

It is a red chaffed variety, carrying a stiff erect straw similar in characteristics to "John Brown" wheat, a New South Wales production. So far, it has done very well, and gives promise of a good yield this year, notwithstanding the fact that rust enveloped all late maturing plants and patches in the crop.

The following interesting comparison of the analyses of the Kubanka and Budd's Early wheats has been kindly supplied by Mr. J. C. Brünnich, Agricultural Chemist:—

Name of Wheat.	Weight in lb. per bushel.	% Nitrogen in Wheat.	% Total Proteids in Wheat.	MILLING PRODUCTS.			GLUTEN IN FLOUR.			Strength of Flour, Quarts per Sack.
				% Flour.	% Pollard	% Bran.	% Wet.	% Dry.	Ratio Wet to Dry.	
Kubanka ... ..	62·8	2·635	16·45	71·8	13·7	14·5	49·8	17·1	2·91	44
Budd's Early ... ..	63·0	2·295	14·34	74·0	8·9	17·1	43·2	15·0	2·89	41·7

Name of Wheat.	% Moisture in Flour.	% Ash in Flour.	% OF NITROGEN IN			% Proteids in Flour.	% True Gluten in Flour.	% Gliadin in Flour.	Ratio Proteids in Wheat to Proteids in Flour.	Ratio between Proteids, Gluten, and Gliadin in Flour.
			Flour.	Gluten.	Gliadin					
Kubanka ... ..	11·65	·974	2·940	2·360	1·252	18·36	14·75	7·85	1·15	100 : 72 : 125
Budd's Early ... ..	12·34	·676	2·215	1·931	1·140	13·82	12·07	7·12	1·03	100 : 59 : 114

*Potatoes.*—Field crop of 3 acres—Blueskins and Brownell's Beauty. The latter variety has proved one of the best all-round potatoes to grow. This spring has not been the most favourable season, as late frosts were experienced which cut back the young growth, and did not give sufficient time for plants to establish themselves before hot weather set in. The photograph was taken eight weeks after planting.



## Dairying.

### THE TUBERCULIN TEST—IS IT DANGEROUS?

In his little text-book on "Milk and Milch Animals," Sir Walter Gilbey has shown that, at its best, the tuberculin test is of very doubtful utility. "It is well," says a correspondent of the "Live Stock Journal," "to consider the question whether it is not very dangerous, as well as being very unreliable. At the dairy show, a gentleman who has been connected with the London milk trade all his life expressed the conviction that the tuberculin test was almost entirely responsible for whatever recent spread of tuberculosis there had been in our dairy herds. 'I bought in fourteen cows three years ago,' he said, 'and all passed the tuberculin test before they went into my herd. After two years they were sold out, when they were all affected by tuberculosis, and I believe firmly that the tuberculin test two years previously planted the seeds of the disease in those animals.' This is one of the most startling statements in connection with the matter, if it should prove to be true, and ought certainly to be considered. We are told that the remedy for tuberculosis is to test the cattle with tuberculin, and get rid of those that react. But, if the test itself plants the seeds of the disease in the healthy animals, the results cannot be otherwise than disastrous. It would, therefore, be well if this important phase of an important subject could be thoroughly investigated."

We submitted this extract to Mr. Sydney Dodd, Principal Veterinary Surgeon and Bacteriologist to the Department of Agriculture and Stock, and he supplies the following comment thereon:—

*Re* your note of the 11th instant, and newspaper cutting as to whether tuberculin test is dangerous, I have to state that there is not a single case on record where it can be proved that a healthy cow has been injuriously affected by the tuberculin test when applied by an experienced observer. This charge against tuberculin has been settled for some years, but it appears to crop up periodically. When the stockowner considers what tuberculin is, and how it is prepared, he will see that any scare as to the danger of using it on a healthy beast is absolutely groundless.

The tubercle bacillus is grown for a number of weeks in broth. At the end of this period all the bacilli are killed by subjecting them to steam temperature. The broth is then mixed with a small percentage of carbolic acid and the whole filtered through a Berkefeld filter. It will thus be seen that it is impossible for even a dead bacillus to find its way into the filtered liquid which contains the broth, plus the products manufactured by the tubercle bacilli, and constitutes tuberculin, and it is, therefore, impossible for it to set up tuberculosis.

Tuberculin is a most valuable diagnostic agent for tuberculosis, but it is unfortunately not infallible. Animals which are in a very advanced stage of the disease sometimes do not show a reaction to tuberculin, and the diagnosis in these cases has to be based on a physical examination by the veterinary surgeon.

The testing by tuberculin is not merely an injecting of so much tuberculin into a beast, and the taking of one or two temperatures. If serious errors are to be avoided, the test must be conducted by an experienced person, as not only the actual rise in temperature must be considered, but what is more important, the *character* of the rise has to be noted. There are numerous other points to be observed in making the test, the neglect or inability to interpret correctly, any one of which, may completely nullify the value of it.



The indiscriminate use of tuberculin by the public has led to a good deal of shady work in connection with the test, and has resulted in some cases in discrediting it. It is known that an animal after it has had an injection of tuberculin will not react in the usual manner to a second injection for some weeks after, whether the beast is tuberculous or not. The consequence is, that unscrupulous stock owners or dealers have been known to inject their cattle with tuberculin a few days before it was to be tested for the buyer, the result being that the animal is not observed to react when the proper test is applied, and the buyer purchases a tuberculous beast, believing it to be healthy. Other cases have been known where men have been more alert than this in unlawful practice. In this case, just before the arrival of the veterinary surgeon, they will give the animal drugs which have the effect of lowering the temperature. The veterinary surgeon, if he is guided only by temperature indication, will find this normal, and may certify the animal free from tuberculosis, even though it is reacting at the time. But, as a rule, the experienced veterinarian is aided in forming his opinion by other symptoms shown by a reacting animal.

Other things to be considered by stockowners are—that tuberculin only shows that the disease is present, it does not cure, neither can it prevent an animal becoming infected, even on the day after it was tested; also, that a certain time, known as the period of incubation, elapses between the time an animal is infected and the time the disease begins to manifest itself on the animal body. Tuberculin injected between those two periods does not give any reaction at all, the consequence being that an animal may contract tuberculosis one week, and the next week be tested, yet it would probably show no reaction, and the animal be sold, quite honestly, as a healthy one. There is also the point mentioned above, that cattle in an advanced stage of tuberculosis, will sometimes give little or no reaction at all.

---

#### REGULATIONS UNDER "*THE DAIRY PRODUCE ACTS, 1904 TO 1905.*"

Department of Agriculture and Stock,  
Brisbane, 5th November, 1908.

The Lieutenant-Governor, acting as Deputy for and on behalf of His Excellency the Governor, and with the advice of the Executive Council, has, in pursuance of the provisions of "*The Dairy Produce Acts, 1904 to 1905,*" been pleased to make the following additional Regulations.

W. T. PAGET.

---

#### *Continuation of Regulations.*

These Regulations shall be read and construed with the Regulations under "*The Dairy Produce Acts, 1904 to 1905,*" published in the *Government Gazette*, dated 19th January, 1906, 20th October, 1906, 17th November, 1906, 22nd December, 1906, 2nd March, 1907, 28th March, 1908, 11th April, 1908, 13th June, 1908, and 15th August, 1908, respectively, and shall apply to the Cities of Brisbane, South Brisbane, Towns of Hamilton, Ithaca, Sandgate, Toowong, Windsor, Shires of Balmoral, Belmont, Caboolture, Cleveland, Coorparoo, Enoggera, Indooroopilly, Kedron, Pine, Sherwood, Stephens, Taringa, Tingalpa, Toombul, Wynnum, and Yeerongpilly.

#### *Situation of piggeries and sanitary conveniences.*

12. No milking shed shall be placed within one hundred and fifty feet from any piggery, earth closet, or cesspit.

#### *Milking bails or sheds.*

67. Every owner of a dairy shall cause the cow bails and sheds used in connection with such dairy to be covered with a roof that is weather-proof, and to be constructed at least seven feet in height above the floor level, and to be lighted and ventilated to the satisfaction of the inspector. He shall



cause the floor of milking bails or sheds to be formed of a durable non-absorbent material laid in such a manner as to be watertight, and graded with a slope to an open drain running the full length of the building, and of such a width as to be swept with a broom, and shall cause it to be continued to a distance of at least thirty feet beyond the confines of the milking shed or bail.

#### *Manure.*

68. Every owner of a dairy shall cause all liquid manure from the milking shed or bail to be drained into an impervious receptacle to the satisfaction of the inspector.

He shall cause all solid manure after each milking to be collected and conveyed to a distance of at least one hundred feet from the cow bail.

#### *Animals other than milch cows, and stables.*

69. Every owner of a dairy shall cause every stable and yard used in connection with the dairy to be well drained.

70. No owner of a dairy shall permit any animals, excepting milch cows, to be stabled or kept within fifty feet of a milking shed or cow bail or milk room, nor permit pigs to be at large on a dairy.

#### *Poultry.*

71. No owner shall keep fowls nor erect poultry houses within fifty feet of a cow bail.

#### *Milkroom.*

72. (a) Every owner of a dairy shall provide a detached room, to be constructed as hereinafter provided, of sufficient dimensions to be used for straining, cooling, or storing milk, or housing utensils used for containing milk, or in the collection or distribution of milk when such utensils are not in actual use.

(b) A milkroom shall be situated at least ten feet away from any milking shed.

(c) A milkroom shall be sufficiently lighted and ventilated, and all openings shall be protected with a fly-proof wire screen of No. 16 mesh wire, and the doors shall be so hung as to be self-closing.

(d) The floor shall be covered with non-absorbent material (to be approved by an inspector) properly set in cement, and laid so that the lowest part of its surface is at least six inches above the adjoining ground. Such floor shall be on a solid, sound foundation, with a proper slope to an impervious channel, which shall communicate with a suitable trapped drain outside the building, or to an approved receptacle situated at least ten feet from the room and from the milking shed or bail. The surface of the floor shall be finished so that it will afford no lodgment for dirt or for liquid. The roof and walls shall be so constructed and finished as to afford no lodgment for dirt.

(e) No dog, cat, fowl, or other domesticated animal or bird shall be allowed to have access to such room.

#### *Utensils, &c.*

73. (a) An apparatus to be approved by an inspector shall be provided by every owner of a dairy for the purpose of heating water for cleansing utensils, &c., and shall be placed in a position approved of by an inspector.

(b) Apparatus for cleansing utensils shall not be used for any other purpose.

#### *Lime-washing.*

74. The owner of a dairy shall cause all milking sheds and bails to be lime-washed at least every six months and at such other times as may be required by the inspector, providing that this requirement shall not apply to any part of such ceiling, roof, or walls that may be properly painted or varnished, or constructed of or covered with any material such as to render the

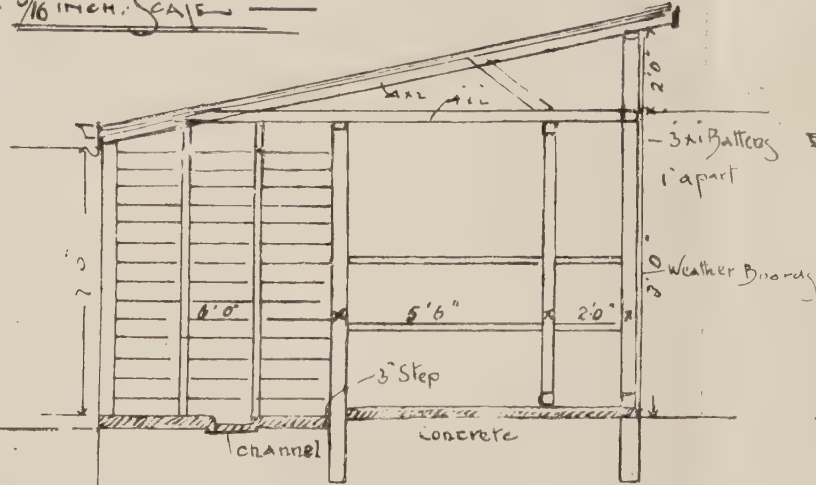
— SKETCH PLAN FOR MILKING SHED AND MILK ROOM —

— AS REQUIRED BY REGULATIONS —

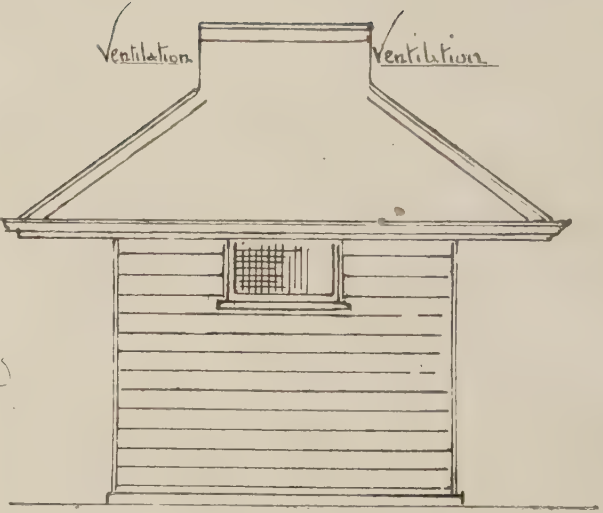
— 3/16 INCH. SCALE —



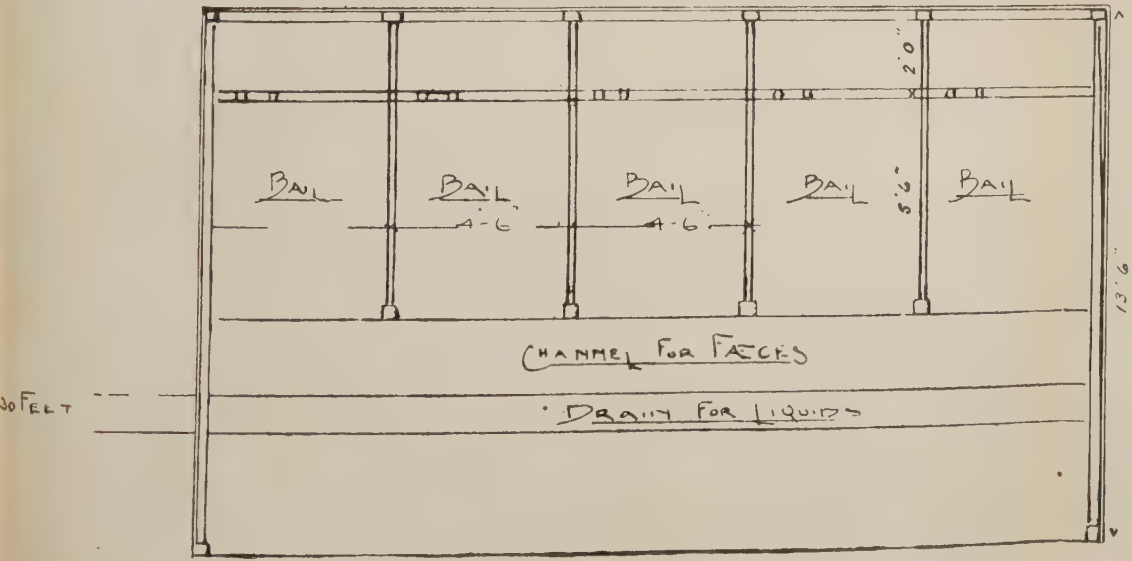
— FRONT OF BAYS —



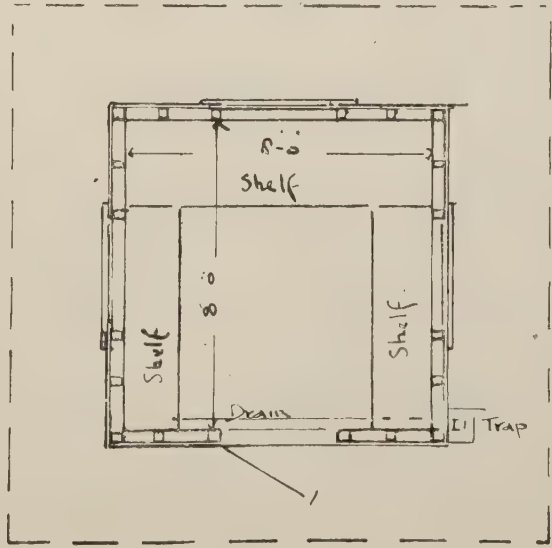
— SECTION OF BAYS —



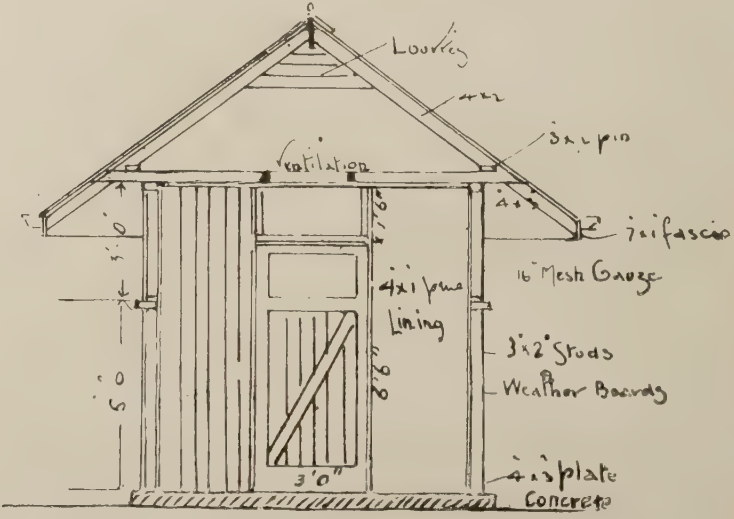
— SIDE OF MILK ROOM —



— PLAN OF MILKING SHED —

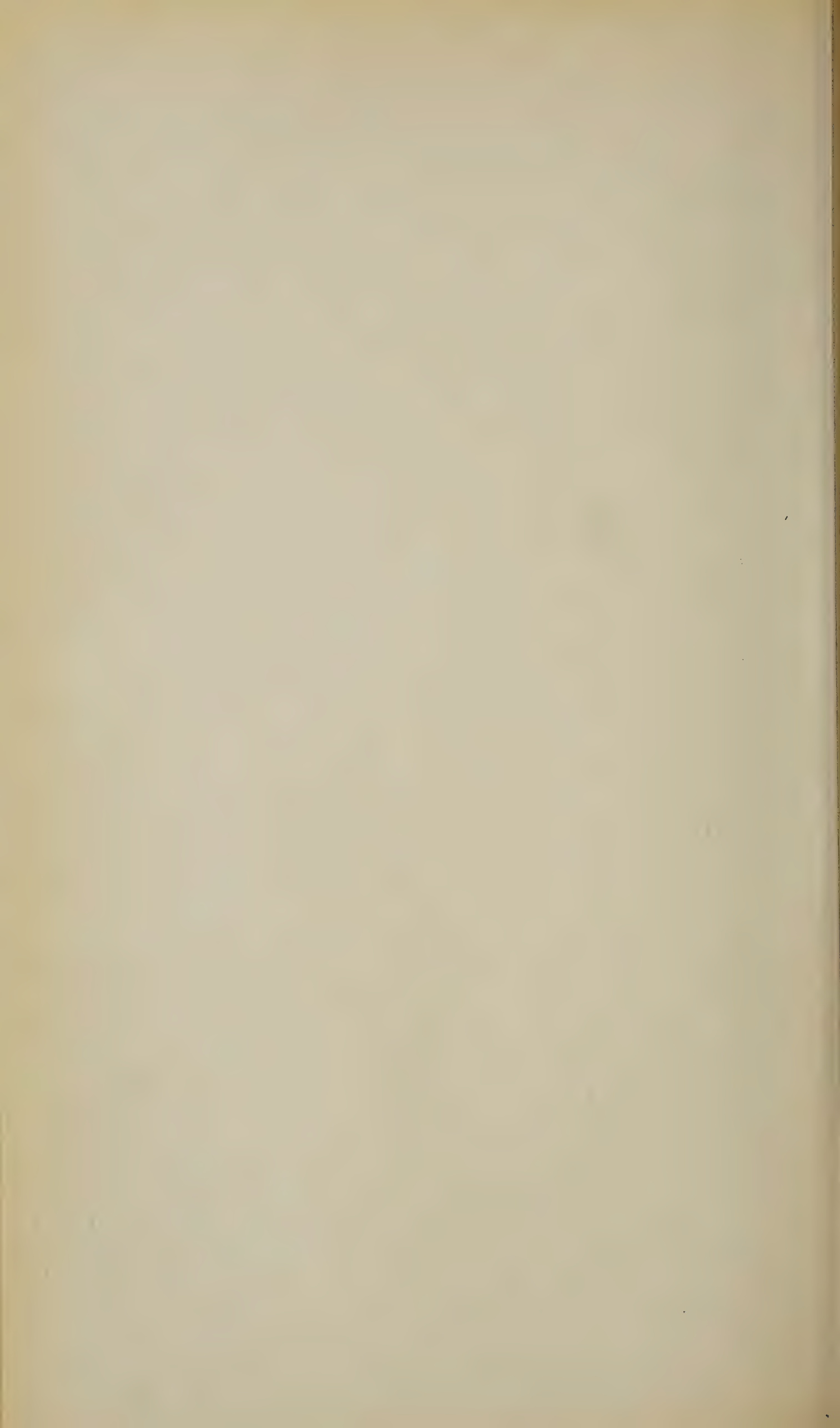


— PLAN OF MILK ROOM —



— SECTION OF MILK ROOM —





lime-washing unsuitable or inexpedient, and that may be otherwise properly cleansed. The owner shall cause the floor of every milking shed to be thoroughly swept and cleansed, as often as is necessary, to ensure that such cowshed shall at all times be reasonably clean. He shall whenever required by an inspector disinfect his milking shed or any other building on his premises in a manner and with such materials as directed by an inspector.

*Unwholesome food.*

75. No owner of a dairy shall feed or permit to be fed to his cows any musty, unsound, decayed, or unwholesome food which may injuriously affect the milk or health of the cows, and if an inspector has reasonable grounds for supposing that any cattle food on the premises is unsound or unfit for use as food, he may require the keeper to remove such food from the premises and refrain from using it for dairy purposes.

*Water supply.*

76. (a) An owner of a dairy shall keep in connection with a dairy an abundant supply of wholesome water. Dairy cows shall not have access to impure water, rubbish, or refuse.

(b) He shall cause any tank or other receptacles which may be provided for storing water to be emptied and cleansed from time to time as often as may be necessary to prevent the contamination of any water that may be stored therein.

*Inspection.*

77. If, after the inspection of the stock in any dairy, an inspector is of opinion, or has reason to suspect, that any of such stock are diseased, he may, in writing, order the owner of the dairy to draft out and keep isolated all such diseased or suspected stock from the stock not suffering from disease. The inspector shall report all animals infected or suspected of being diseased in accordance with the diseases in the First Schedule to "*The Dairy Produce Act of 1904*," and if the Minister is satisfied the animals are infected and orders the same to be destroyed, they shall be destroyed. Milk or other dairy produce from time to time obtained from such diseased or suspected stock shall be destroyed. Such owner shall forthwith obey such order and shall continue to keep isolated all such stock, and from time to time destroy or otherwise deal with such dairy produce until the inspector otherwise orders. He shall, if so required by an inspector, tag, or brand, or otherwise mark any isolated animal for the purpose of identification.

*Use prohibited.*

78. The owner of a dairy in which there are diseased stock, or in respect of which an inspector has made an order of isolation, shall not, until the inspector permits him to do so, mix the milk or other dairy produce from time to time obtained from any diseased or suspected stock with other dairy produce, or sell, or expose for sale, or use, or cause or permit to be sold, exposed for sale, or used, the same in any way whatsoever for the food of man or of any animal, nor shall he permit such milk to be used for the food of animals until it has been boiled.

*Penalty.*

79. Any person committing a breach of any of these Regulations shall be liable to a penalty not exceeding ten pounds.—*Government Gazette*, 7th November, 1908, pages 959-60.

---

ANGORA GOATS.

Angora goats have been found particularly useful in Wairoa, a district in the North Island of New Zealand, as destroyers of the blackberry. Portions of the country, which a few years ago were "an impenetrable mass of this, perhaps the worst of all noxious weeds," have now been raised to the



carrying capacity of two sheep to the acre, thanks to the introduction of the Angora goats. They are particularly fond of the foliage and young shoots of the plant, and have literally cleared large areas of land. They show an aversion for any kind of grass, preferring coarser herbage; this preference has its drawbacks, as was found by a farmer who turned a few into a field of rye grass; the goats ignored the pasture, but nearly ate their way through the surrounding hedges. [What other results could have been expected?—ED. "Q.A.J."]

Another objection to the Angoras is that they are difficult to muster, being very active, preferring rough ground, and being addicted to scattering in all directions as soon as a horseman or dog appears in sight. Each goat takes up its position on the most inaccessible site it can find, and stands on the defensive, defying dog and man. This habit makes the task of collecting them a heart-breaking one, and is said to completely ruin good sheep dogs, which are accustomed to more docile charges. The valuable fleece also is troublesome to shear; their coats are beautifully clean and free from foreign matters from skin to tip, but there is no yolk in the hair, and this compels the shearer to stop continually and oil his machine while taking the coat off a single animal. Very fine examples of the Angora in Australia have given as much as 16 lb. of hair, which fetches 4s. 6d. per lb., a total of £3 12s. for the fleece. This being the case, it is not wonderful that the Angora is receiving attention in New Zealand.—"Live Stock Journal."

For the illustrations of South African Angoras here given we are indebted to the courtesy of Messrs. Dalgety and Co., in whose excellent "Monthly Review" for December they came under our notice.

They show, says the "Review," the advanced state to which the breeding of Angora goats has attained in South Africa. The Hobson family of the Graaff-Reinet district, Cape Colony, are the leading South African breeders, and the big weights, combined with the all-round excellence of their Angoras, demonstrate unmistakably how they have succeeded in improving the animal by careful and scientific breeding. The importance of the mohair industry in South Africa is illustrated by the value of the annual export of mohair from Cape Colony, which amounts to no less a sum than £600,000 per annum. The whole of the production is practically exported to England, and manufactured in the great wool centre, Bradford.

That the South Africans are desirous of keeping their industry a close monopoly is shown by the fact that the Cape Parliament in recent years placed a prohibitive export tax on Angoras of £100 per head. Whether this policy will prove beneficial to them time will prove, as the United States of America has a large and growing industry, and no restrictions are placed on their export there, several stud Angoras having already been introduced into Australia from that quarter, individual fleeces cut from them and their progeny weighing up to 10 lb. per head.

No doubt it will be many years before Australian breeders can hope to produce animals equal to the best of South Africa, but many large undertakings have sprung from small beginnings, and let us hope this will be the case with the Australian Angora goat industry, the foundation of which is now being laid, as the following figures in reference to last year's shipment of mohair from New South Wales and Queensland show—viz., 3 tons, of a value of £250.

The prices realised for the principal lines will no doubt be read with interest, being a guide to current values.

#### REALISATION OF MOHAIR IN LONDON, 1908.

##### *From New South Wales.*

	Per lb.	
Fleece, unskirted,	14½d.	... Buckland, J. A., Gulgong
"	"	13½d. ... Blaxland and Knox, Wyalong.
"	"	12½d. ... Martin, Geo. H., Wentworthville.





ANGORA RAM, PRIDE.





*Plate XVI.*



ANGORA EWE, MAUD.





Fleece, unskirted,	12 $\frac{1}{2}$ d.	...	Failes, Dr., Coonabarabran.
"	"	10 $\frac{1}{4}$ d.	Mitchell, Geo., Wagga.
"	"	9 $\frac{3}{4}$ d.	Poole, Willm., Bathurst.
"	"	8 $\frac{1}{4}$ d.	Kemp, A. F., Manilla.
"	"	7 $\frac{1}{2}$ d.	Allan, Geo., Manilla.

*From Queensland.*

Fleece, unskirted,	14 $\frac{1}{2}$ d.	...	Price, A., Pickanjinie.
"	"	11 $\frac{1}{4}$ d.	Green, Jas., Yeulba.
"	"	9 $\frac{1}{2}$ d.	Roberts, C., Mitchell.
"	"	9 $\frac{1}{2}$ d.	Bassingthwaite, Jandowaie.
"	"	9 $\frac{1}{2}$ d.	Simpson, G. H., Torrington, Toowoomba.
"	"	9 $\frac{1}{4}$ d.	Jackson, W., Yelton, Byrnestown.
"	"	8d.	Myles, Miss, Mt. Elsie, Charters Towers.
"	"	7 $\frac{1}{2}$ d.	Wilson and Symons, Semla.
"	"	7 $\frac{1}{2}$ d.	Lonergan, F. and L., Bowenville.
"	"	6 $\frac{3}{4}$ d.	Hampson, C., Gowrie rd., Toowoomba.
"	"	6 $\frac{1}{2}$ d.	Olsen, P., Clermont.
"	"	5 $\frac{1}{2}$ d.	Mathieson Bros.

The word "mohair" is the technical name for the fleece of the Angora. Mohair differs from the wool of sheep in that it does not have the felting properties of the latter. It is this felting property of wool which distinguishes it principally from other animal fibres. Mohair is a hair proper, being devoid of scales, and so is not successfully used alone in felt goods. It is not equal to wool in fineness, but in breaking strain there is a considerable difference in favour of mohair. It is to this strength of the fibre that the great durability of mohair goods is ascribed.

In elasticity there is but a slight difference between wool and mohair. All mohair has a lustre peculiarly its own, being much more pronounced in some fleeces than in others. A fleece of low lustre indicates a goat under low conditions, as poor breeding, poor feeding, or sickness.

A mohair fleece may be washed, scoured, steamed, dyed, and worked up into fabrics, but none of these processes remove any of the lustre; indeed, all of them operate only to intensify them.

The three leading features of the mohair staple are—strength, length, and lustre. Mohair manufactures have already a very extensive use, but they appear in the stores under so many trade names that only a few people know they are the product of the Angora goat. These manufactures are so varied, and the fibre adapted to so many uses, that only a recital of some of the principal uses of mohair can be given here, but these will serve to show how extensive is their use at the present time. Plushes for upholstering railway carriages and furniture, ladies' lustre dress goods, and alpaca goods are chiefly made from mohair; wig-making also consumes a large quantity of mohair.

**PRIDE.**

Ram, as at 18 months, cut 11 $\frac{1}{2}$  lb. mohair in 13 months. One of first prize pen at Grahamstown, 1903. Registered No. A103 S.A. Stud Book. Second prize at Grahamstown and Port Elizabeth, 1905, when he cut 19 lb. hair in 12 months.

**MAUDE.**

Taken when 18 months old, with 13 months' growth of hair; cut 9 $\frac{3}{4}$  lb. Second prize Grahamstown, 1903; first prize, Grahamstown and Port Elizabeth, 1904; first prize, East London, 1906; second prize, Port Elizabeth, 1906; first and champion, Capetown, 1907; second prize, East London and Port Elizabeth, 1907. Registered No. AB696 in S.A. Stud Book.



# THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

## RECORD OF COWS FOR MONTH OF DECEMBER, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Pee wee ...	Holstein-Sh'rth'm	20 May, 1908	899	4.4	44.40	
2	Laura ...	Grade Shorthorn	16 Nov. "	1,077	3.6	43.08	
3	Whitefoot ...	Holstein-Devon	20 Oct. "	992	3.5	38.50	
4	Daisy ...	Holstein ...	24 Oct. "	915	3.5	35.51	
5	Dewdrop ...	"	10 Nov. "	964	3.3	35.14	
6	Dora ...	Grade Shorthorn	18 Nov. "	885	3.5	34.34	
7	Dot ...	"	12 Nov. "	868	3.3	31.64	
8	Comet ...	" Holstein ..	22 Nov. "	792	3.5	30.73	
9	Sue ...	"	25 May "	701	3.9	30.51	
10	Carrie ...	Jersey ...	16 Jan. "	792	3.5	30.73	
11	Cocoa ...	"	10 Nov. "	569	4.7	30.11	
12	Wonder ...	Grade Shorthorn	1 Dec. "	713	3.6	28.52	
13	Burton's Fancy	Shorthorn ...	7 Sept. "	496	5.0	27.99	First calf
14	Ethel ...	Grade Shorthorn	3 Sept. "	720	3.5	27.94	
15	Eve ...	Jersey ...	16 Oct. "	620	4.0	27.71	
16	Lily ...	Ayrshire ...	2 May "	496	4.8	26.83	
17	Graceful ...	Jersey ...	10 Dec. "	598	3.9	26.01	
18	Grace ...	Shorthorn ...	30 May "	614	3.6	24.56	
19	No. 112 ...	"	24 Nov. "	651	3.4	24.49	
20	No. 1 ...	"	1 Nov. "	682	3.2	24.06	
21	Nancy ..	Grade Guernsey	7 May "	583	3.7	23.99	First calf
22	Lubra ...	" Holstein ...	5 Jan. "	534	4.0	23.86	First calf
23	Careless ...	Jersey ...	3 Dec. "	558	3.8	23.61	
24	Lark ...	Ayrshire ...	6 Jan. "	558	3.8	23.61	First calf
25	Len ...	"	6 Mar. "	558	3.8	23.61	
26	Lady Loch	"	24 June "	527	4.0	23.55	First calf
27	Nita ...	Grade Shorthorn	23 Nov. "	620	3.4	23.33	
28	Glen ...	Shorthorn ...	10 Feb. "	403	5.0	22.74	
29	Night ...	Grade Holstein ...	5 Oct. "	682	3.0	22.45	
30	Lalla ...	"	28 July "	560	3.6	22.40	First calf

Cows were fed on natural pasture only.

## TO CRYSTALLISE FRUITS.

The following method of crystallising fruit is given in the "Agricultural Journal" of the Cape of Good Hope (July, 1908):—

The means of preserving fresh fruits in a crystallised form is attained by extracting the juices from the fruits and replacing them with sugar syrup, which, upon hardening, preserves the fruit from decay, and at the same time retains their natural shape, and, to some extent, flavour. The process is as follows:—Fresh fruit, nearly ripe, whole, or cut into quarters, in the case of citrus and such large sorts, should be boiled until they are soft enough to be handled without breaking. In the case of citrus fruits, the rind should be lightly pared off, and the pulp removed, at least a couple of hours before boiling. The softer kinds, such as peach, plum, apricot, &c., would merely be steeped in boiling water for a very short time, care being taken that they are not immersed sufficiently long to be cooked. The exact time can only be determined by actual experience. After this, the water from the fruit should be allowed to drain off thoroughly, and, when sufficiently dry, they should be placed in hot sugar syrup, and kept there for a few days, so that the sugar may enter the fruit cells and displace what juice remains after the boiling or scalding process. The fruit should then be lightly washed in clean cold water, and packed in dry white sugar while wet, and allowed to remain there and dry off in a draught, until it is hard enough to be packed away for transport. A common home recipe for preparing sugar syrup is:—1 lb. white sugar to 1 pint of water, adding the white of an egg to every 4 lb. of sugar; boil this mixture over a fast fire for twenty minutes, and strain through a cloth while hot, when it is ready for use.

## The Horse.

### CLIPPING HORSES.

In our issue of December, 1908, we published a short article on clipping horses, in which it was recommended that, with well-fed horses, the hair should be left on the extremities, and also on parts liable to be much worn by harness. Young beginners are desirous of advice on this point, which, however, it is not always easy to give, unless one has personal knowledge of the class of animal in question and the amount of work he is accustomed to. A writer in the "Live Stock Journal" on clipping or singeing horses says:—

"With regard to hunters, of course there is no question as to the advisability of clipping them, or at least the greater portion of the surface of the body, but in some animals, especially those with a "thin" or irritable skin, it is better to leave the saddle mark and the lower parts of the limbs unclipped, with a view of preventing sore backs and that form of skin eruption commonly known as "mud fever."

"Heavy draught horses doing only walking-pace work are, as a rule, best left with their full coats on, but the question frequently arises as to whether or not heavy van horses, or horses that are sufficiently substantial to be termed cart horses, but whose work is chiefly long-distance road work at a slow pace, such as millers' brewers', timber-haulers' horses, should have any part of their coats removed, and if so, to what extent, and which parts should be clipped, and which left with the coat on.

"Some persons are great advocates of clipping the limbs and abdomen, removing the coat about trace high in such animals, but, in my opinion, this practice has a serious objection to be raised against it, because, while undoubtedly allowing the horse so clipped to move with somewhat more freedom, and facilitating the removal of dirt, &c., it certainly renders the animal more susceptible to cracked heels, mud fever, and internal congestive diseases of the abdominal organs, and probably of the lungs too, unless great care is taken to protect these parts—that is, the clipped parts—from cold draughts, particularly when they are damp. One point respecting the clipping of horses' legs is, I think, well worthy of notice, and this is, that it is a fact that horses that have become somewhat "stale" on their legs during the summer months actually improve if their legs are clipped while working through the winter. This is due to the stimulating action of cold air on the skin of the limbs, to which it has free access by the removal of hair.

"Very similar remarks apply also to the middle class or tradesmen's horses, for it may be taken that, as a rule, unless the horse has a fine coat naturally, or it is impossible to prevent undue exposure to cold and wet, it is best for the health and comfort of the animal to remove the coat, providing it is done fairly early in the season and a reasonable amount of artificial protection is substituted when the horse is not at work or being in any other way exercised."

---

### HORSES NOT LYING DOWN.

Cases not infrequently occur of stabled horses acquiring the habit of not lying down to sleep at nights, but remaining standing up in their stall. This habit is a most objectionable and, in fact, a most harmful one, because it prevents the horse from obtaining proper rest, and that, as may readily be imagined, tells adversely both upon the animal's condition and upon its working capacities. The legs also suffer very considerable harm when a horse gets into the habit of never lying down, since they are never relieved of the



weight of the body, but have to support it in the night-time as well as during the day. Thus they are subjected to an unintermittent strain which tends to wear them out prematurely. For a horse always to remain standing and never to lie down is, of course, an entirely unnatural habit. To break the animal of it once it has become firmly established is at best very difficult and oftentimes practically impossible. Various causes may give rise to this unfortunate and harmful stable habit, by far the most common undoubtedly being stiffness of joint resulting from age. Thus some old horses habitually refrain from lying down at night, or in the daytime either, because, owing to their being somewhat stiff in their joints, it proves irksome and troublesome to them to lie down and get up again. Rather than make the special efforts which in their case lying down and rising up involve, they prefer to remain standing, and to sleep in that uncomfortable position. In this way they gradually get into the habit of sleeping while standing; and the longer they continue in it, the more firmly established does it become, until finally nothing will induce them to lie down in the stable. Sometimes the only reason why a horse will not lie down at night is that its stall is unduly narrow, so that the animal cannot move about sufficiently, preparatory to lying down. Horses are very commonly somewhat fidgety when they are about to lie down, and like to have plenty of room to move about in when doing so. Hence it will in some instances happen that a horse, on finding its freedom of movement too much restricted by the extreme narrowness of the stall on attempting to lie down, will not do so, and in this way he gets into the habit of remaining in a standing position overnight instead of lying down. In such cases the evil can generally be easily remedied by placing the animal in a roomier stall or, better still, in a loose box, if this is available. On finding itself in more roomy quarters where it has more freedom of movement, the horse will readily lie down.

When young horses are taken up into the stable and stood in a stall for the first time, it not infrequently happens that they refuse to lie down for the first few nights, because, after enjoying complete liberty, they are unaccustomed to such cramped quarters and to having their freedom of movement so much interfered with by being tied up by the head. This naturally makes them feel very awkward at first when attempting to lie down, and may render them altogether disinclined to do so. When a young horse thus at first refuses to lie down, it usually adapts itself to the new conditions sooner or later, and learns to lie down in its stall in the natural course of events, so that no anxiety need be felt when the animal refrains from lying down for the first few nights.

Sometimes—though this happens but comparatively rarely—the habit of not lying down at night-time is acquired by a horse as the result of its having been cast in its stall. This awkward accident—particularly if the animal in question is of a nervous temperament—may frighten it so greatly and remain so impressed upon its memory—horses have a most retentive memory, particularly for disagreeable things—that for the future it is afraid to attempt to lie down for fear of a similar accident befalling it. When a horse acquires this objectionable habit in the manner just described, it may be that under favourable conditions the animal will in the course of time forget about its aversion to lying down, and lose the trick again without any special measures being taken, but more likely than not, once the horse has got into the habit of remaining standing up at nights as the result of being cast in its stall, it will continue in it, unless some special means are adopted to break it of the same.

In seeking a cure, the first remedy is to place the horse in a loose box if one is available, the animal, of course, being left loose, so that it can move about therein at will. The roomier the loose box is the better. Though it may be averse to lying down in a stall, and when its head is tied up (under which conditions its movements are so greatly interfered with and restricted),



the horse, on being accommodated in a loose box, will very usually lie down readily enough on finding that it enjoys complete freedom of movement and can turn about as much as it likes. A deep bed of straw should also be provided, as a plentiful supply of litter will be a further inducement to the horse to lie down. Once the animal has learned to get down again, it will continue to do so, and it will thus quickly lose its habit of remaining in a standing position at nights. Should a loose box not be available, the horse may be quartered in an empty barn or in a coachhouse—the kind of accommodation matters little, the essential thing being that the horse should enjoy ample room so that it can turn about at will, and that it should not be tied up. Given these two conditions, it will be found in the majority of cases that horses which have got into the habit of not lying down in a stall will speedily lose it again. It will, of course, not do to transfer them back to a stall for some considerable time after they appear to have been cured of their bad habit, because on the horse once more being placed in circumscribed quarters, and having its head tied up, the old trouble will most probably recur. The horse must be left in the loose box or other roomy quarters for a long time, so that it may quite forget about its former habit of not lying down.—“Live Stock Journal.”

---

### GLENTHORNE MONARCH.

The fine Suffolk Punch stallion, Glenthorne Monarch, illustrated on the next page, was purchased in Adelaide from the Hon. George Brookman, M.L.C., O'Halloran Hill, and arrived here in December, 1908, being then sent on to the State Farm, Gindie.

He is a fine chestnut horse, with blaze, two years old, active and docile, a characteristic of this excellent breed of farm horse.

His pedigree is thus given in the British Suffolk Stud Book, vol. 16:—Glenthorne Monarch, 3444, foaled 30th September, 1906; sire, Rendlesham Collegian, 3175; dam, Rendlesham Snowdrop, 8087, by Toller's Oberon, 2778.

Glenthorne Monarch took first prize as a two-year-old at the last Adelaide show.

He arrived at Gindie in splendid condition after his long journey by sea, rail, and land from Adelaide to his destination.

---

### FORESTS OF JAPAN.

Fifty-nine per cent. of the total area of Japan is under forests—that is to say, that forests cover 58,000,000 acres of the country. Of this area the State owns 33,000,000 acres, the Crown nearly 5,250,000, municipalities over 4,250,000, shrines and temples nearly 500,000, and private owners nearly 15,000,000 acres. Yet Japan imports more timber than she exports. The exports are represented by £250,000 worth of timber and £850,000 worth of wooden matches. The net revenue from the State forests is £1,600,000 per annum, an increase of 16 per cent. in the past twenty years.

The making of tea chests has long been one of the industries of Japan, but the timber of which the momi tea chests are made, and which later for many years have been in great request, is becoming increasingly scarce, and there has been a very great shortage of Japanese chests in India. As regards the import of timber, in 1907 the imports of log timber and planks to the open ports of Auping and Takow, in South Formosa, amounted in value to £69,250. Japan in the same year imported timber to the value of £235,400. and exported £396,935 worth.



## Poultry.

### THE MARKETING OF POULTRY.

The Board of Agriculture and Fisheries, London, has issued the following leaflet (No. 201) on the marketing of poultry, which will, at this season, prove of much interest to prospective shippers of poultry from Queensland to London:—

The demand for high-class poultry in Great Britain has very greatly increased in recent years, and, even apart from the growth in the population, there appears to be ample room for extension in the home supply. Even in those markets where the chief business is in unfattened specimens, a steady increase in the sale of finer quality fowls is evident. As their greater value is appreciated by consumers, it may be anticipated that the demand for these will grow. The object of most producers should be to provide for this better class trade. American, Russian, and other Continental supplies are frozen, and do not enter into very serious competition with freshly-killed British poultry if of suitable breeds and well finished.

### MARKETS.

*London.*—The best markets in the country are those of Leadenhall and Smithfield, in London, but to obtain good prices the birds sent up must be very carefully fed and well finished. Overstocking of these markets with the very best quality of fattened birds is hardly likely to occur, and for birds of 4 to 5 lb. and over, according to the season of the year, there is a ready sale. Where disparities in prices in the same consignment occur, it will frequently be found to be due to variation in size and quality. During the spring there is a good demand for young chickens, weighing  $2\frac{1}{2}$  to 3 lb., unfattened but well fed, and a more limited sale of milk chickens, weighing about 12 oz.

In the London markets the best season for large, well-fattened fowls is from November to February, and from March to July for moderate-sized birds. Ducklings sell fairly well all the year round, but best from February to June; there is a fairly good demand for fat ducks in the autumn and winter; goslings in May and June, and at Michaelmas; fat geese at Christmas and for a short time afterwards, but their season is limited; turkeys fetch high prices, according to size, appearance, and straightness of breast bone, at and for a very short time after Christmas. As to days of the week at Smithfield (Central Market), Tuesdays, Thursdays, and Fridays are best; at Leadenhall, Mondays, Wednesdays, Thursdays, and Saturdays.

*Provincial Markets.*—Information as to demand, prices, &c., in a large number of the best markets outside London will be found in the "Journal of the Board of Agriculture" for February, 1908, p. 641, and May, 1908, p. 94.\*

### KILLING.

All birds should be starved for twenty-four hours before killing in order that the crop and intestines may be emptied of food. A great amount of loss arises from neglect of this precaution. They should be killed by dislocating the neck just where it joins the head, unless the purchaser wishes them to be killed in a special way. Some salesmen like them to be bled by a knife passed through the slot in the roof of the mouth, but this is required in only a few cases. Bleeding is apt to spoil the feathers and soil the packing,

---

\* The Journal may be obtained from the Offices of the Board of Agriculture; price, 4d. per month, post free.

and this will reduce the price of the whole consignment. Dislocation of the neck, properly performed, results in the breaking of the jugular vein, and the blood drains completely from the body veins into the neck.

#### PLUCKING.

Birds should always be plucked while the body is still warm, as the feathers then come out more easily, and there is less danger of tearing the skin. Except among the poorer class of buyers, a badly-plucked bird is of but little value. Unless plucking is done when the bird is warm, it should not be done until the bird is quite cold—that is, at least twenty-four hours after killing.

In plucking, the operator should hold the bird by the legs, with the head hanging downwards, or in the case of turkeys and geese suspend it by the legs to a cord hung from the roof. Feathers are drawn by a firm yet gentle pull towards the head, this action loosening them from the skin.

The plucking should begin at the tail and be continued in the following order:—Back, neck, wings, sides, legs, and breast. It is unwise to start with the breast, as the surface veins in that part of the body are the last to drain dry, and the carcass will be discoloured if any of these veins are broken. The breast bone should not be broken.

Fowls must be plucked clean, except for the head and half the neck; turkeys must also be plucked clean, but leaving the feathers on the outer ends of the wings and the tail; in ducks and geese the wings and half the necks must be left unplucked.

The legs and feet of all birds should be very clean.

#### SHAPING.

When quite clean, chickens should be singed and packed tightly, breast downwards, in a shaping trough, with the heads hanging over the front board, and left in this position for the flesh to set and cool. A long narrow board should then be placed along their backs, and the board weighted, a common method being to use a 9-lb. brick to every two birds. In placing the birds in the trough, the stern is pushed hard up against the back board, thus giving the birds a shortened appearance. Shaping troughs are usually made to hold eight or twelve birds.

For some markets the birds are required to be tied down in Devonshire fashion. This is done as follows:—

Immediately after plucking the back, the claws are removed and a gash is made on each side of the middle toe. A short string is then tied to each of these toes, the legs are drawn forward and inwards, and the two strings are tied together behind the neck, and pulled tight. A second and rather longer string is now tied round the hocks, crossed on the vent, and fastened at the back of the tail, again pulling tight. Finally, the wings are tucked in, and the bird will be ready for packing directly it is quite cold.

Ducks and geese have the wings turned, and are usually weighted, thus compressing them into a good shape. This must be done when they are warm, otherwise they do not set properly.

Turkeys are tied down in the way described as the Devonshire fashion for chickens, or in the Norfolk fashion.

#### GRADING AND PACKING.

A most essential point is that all poultry should be quite cold before they are despatched. On large plants a chilling chamber is found most useful, but in the absence of this they should be allowed to remain for some hours in a cool room, until the body heat is entirely gone.

The question of the grading of poultry is also of great importance. It is very desirable that only birds of about the same size should be packed



together, but if those of different sizes must be placed in the same package they should be arranged in layers, and the fact that they are so packed should be stated when advising buyer of despatch. The sizes may be 3 to  $3\frac{1}{2}$  lb.,  $3\frac{1}{2}$  to 4 lb., 4 to  $4\frac{1}{2}$  lb., and  $4\frac{1}{2}$  lb. to 5 lb. It is advisable that separate pads, baskets, or boxes should be used for different sizes, each box being marked with a distinctive brand and clearly showing the number and size of the birds. In Surrey it is the practice after the chickens have been shaped for them to be floured and packed in specially made crates called "pads," which are of different sizes, and hold respectively twelve, sixteen, twenty, and twenty-four birds.

Ducks, geese, and turkeys should be sent in baskets or strong crates, with the number and actual weight of the contents marked on one end outside.

In packing poultry the birds are laid breast downwards on clean straw, and packed as tightly as possible to prevent them shifting while on rail. Clean butter paper is, by the best packers, placed between each layer of birds to prevent the straw marking the backs and rubbing off the skin. Though this means a few more minutes per package, it brings a more ready sale, and is an excellent practice.

#### FORWARDING.

A postcard should be sent to the buyer or salesman telling him by what route and train the crate will travel, and mentioning by what mark he will be able to identify the crate.

The crate should travel by an evening train, in order to reach the market in the very early morning, and it should be consigned at dealers' rates. In warm weather the birds are less likely to be heated if they travel by night.

#### GENERAL.

There is a growing demand for goslings weighing from 6 to 8 lb. during the London season—from the middle of May to the end of June. Goslings sold then are off the ground before keep becomes valuable for other farm stock.

Fowls should not be drawn when sent to the markets, but some buyers prefer them to be "roped"—that is, to have the intestine drawn out at the vent, leaving the rest of the inside intact, during the hot months. This is frequently done in the Midlands and Ireland. Unless the distance from the market is considerable, the birds are unpacked and sold within a few hours of despatch, so that this practice is not generally necessary except in hot weather.

It is the custom on farms to keep old hens long after they are really profitable from a breeding or laying point of view. A hen is rarely worth her keep after the conclusion of her second year. But these are in demand at Easter, in June, and early July, when good prices are paid by Jewish dealers. They should be in good condition, and be sent alive.

---

#### COMMON SENSE IN THE POULTRY YARD.

I do not claim, says S. Gordon, in the New South Wales "Farmer and Settler," that what I have to say will be couched in language that will gain me any reputation as a literary man, but I do know that, as it is the outcome of twenty years' experience, it is not likely to be far wrong from a practical standpoint, and may be of great benefit to farmers who are either keeping poultry for the first time or are beginning to take an interest in their old flocks on the farm.

I have been working along the same lines, as I say, for twenty years, and I am, therefore, likely to know more about the subjects I write of than the mushroom men who spring up from time to time; nevertheless, I am

quite prepared to take up any new idea worth attention, just as a farmer will grow a new crop or raise a fresh class of stock if the prospects are promising.

To be a successful poultry farmer you must have a knowledge of the business, just as to succeed in any other vocation you must be acquainted with the rules governing it. If you have not the requisite knowledge and experience to-day, there is no reason why you should not get it if you are built that way. If not, do not touch poultry farming, for you will only be inviting failure. For a man to try to raise poultry who is cut out by Nature for a musician is to court disaster.

I will try to show you the right way to start.

You must have your houses before your fowls; therefore the first thing is to choose your site. The fowl-houses and runs must be on high ground—the higher the better—and if you attend to this you will not have many sick hens. Do not spend a lot of money on fowl-houses; build of whatever is handiest and cheapest. And as to the architecture of the fowl-house, one style is pretty well as good as another. The important thing is that they should face the north, and be open at the front, with closed sides and back. See that there are no cracks, the ventilation being provided by an open 6-in. space immediately under the roof at the back and along the sides. Raise the floor above the level of the yard, and put in the roosts 2 ft. from the floor all on one level.

To prevent cats or other pests from gaining admittance you may close the front with wire-netting and a netted door; covering also the 6-in. ventilation space.

I want to impress upon you that this is a roosting-house only, and must not have any nests in it.

If you have many layers you will require to build a separate nest-house and scratching-shed, but if you only have a few nests they may be placed under a tree facing the north and covered with waterproof material. If the nests are placed in the houses the hens will sleep there instead of on the roosts, and will leave their droppings behind them.

Now I shall say something which will probably surprise most of my readers. There is no necessity to lime-wash the fowl-house for fear of vermin. If you saw my yard you would be surprised at the absence of the whitewash brush; but if you looked carefully you would notice also the absence of lice. Paint the joints and the end of the roosts once a month in cool weather and weekly in hot weather with kerosene or wood-preserving oil to which you have added a little strong-smelling disinfectant, and you need have no fear.

The farmer may not have time to clean his fowl-house out every day; in that case let him just dust the droppings with wood or coal ashes and he will neither have a disagreeable smell nor any vermin. The fowls, too, will eat the charcoal mixed with the ashes. Remember this, that fowls do not breed vermin, but that dirt does.

Dust the nest once a month with tobacco dust, and let the birds have some clean soil for their toilet, and you will have no trouble with lice.

You will ask me which are the best breeds to keep. There is no best breed, but there certainly is a best strain of each breed, and it lies with you whether you will spoil or improve the strain you fix upon.

Naturally there are certain breeds more suitable for the table, and certain other breeds that are specially adapted for egg-laying. If you want an all-round bird, good for eggs and good for the table, choose the Black Orpington or the Langshan. Either of these will lay up to 200 eggs per hen per year. A few years ago if I had told anyone this they would have laughed, but good breeding and good feeding have brought poultry along to the 200-egg stage, and it lies with us to get 300 eggs per hen.



I advise that you keep the pure breeds of fowls, as by crossing two of the best laying breeds you produce mongrels.

If you are looking for a layer only, a single-comb White Leghorn will take some beating. But for laying when eggs are dearest give me a good strain of Black Orpington or Langshan. Most people who fail with the Asiatic breeds do so because they allow them to get too broody instead of taking them off the nest before they lay their last egg. If the birds are put into a strange-looking coop, and fed well for two or three days, and are then put back into their own pen, they will start laying again as briskly as ever.

In mating your fowls be sure to have plenty of hens with the male bird, say twelve hens with a first-season cock, and seven or eight hens with a second-season bird. It is a great mistake to have too few hens to each male bird, as this entirely defeats the object aimed at—a large proportion of fertile eggs.

The most important knowledge one can have in the poultry business is how to feed. Feeding stud birds is vastly different from feeding the laying stock for the production of market eggs.

Take the stud birds first. They get two feeds, one in the morning and one at night, both of grain. Do not give them their full, but allow them a good range with plenty of green stuff.

The laying hens should be well fed three times a day, with mash morning and noon, and grain at night. It is not essential for egg-laying that they have green stuff, but they should have for the benefit of their health. They must have grit of some sort to grind up their food, and oyster or sea shell to provide the lime in the egg shells. As an egg is largely composed of water, the hen should never be allowed for a single hour to be without plenty of fresh water.

In setting out to get market eggs, the feeding is much more important than most people think. Some poultry-keepers go crazy on green feed, but, whilst this is good, as I said before, for the health, it has no particular egg-making value. For eggs you must feed solid food, and good quality at that. A crop farmer would not expect to get a big yield from played-out soil unless he fed it well with manure. So with the fowl: If you want the eggs, you must supply the kind of food that will make eggs. And as the hen requires a certain quantity to maintain her own strength, you must bear in mind that it is only the surplus which goes into egg production. The dairyman will understand this. If a hen is not in good condition she cannot lay well.

I believe I was the first to advocate feeding the laying hens as much as they cared to eat three times daily. People have told me that if they fed on this principle their hens would die of over-fatness. To that I reply that if a bird will not stand heavy feeding she should have her head cut off, as she is clearly by nature and constitution a table bird and not primarily an egg layer. A good layer can be compared to a good milking cow. Just as with the good cow the surplus food goes into the production of milk, so with a good laying hen the surplus goes into the eggs instead of into fat.

Some advise that the hens ought not to be fed until they have enough, and that the quantity should be measured out. This is all rubbish. Big results can only be obtained from high feeding.

The oftener you clean out the hen-house the better. You cannot afford to feed high-priced grain to keep up vermin.

Turkeys are very nervous birds, but will repay care and attention. Try to bear in mind that the turkey is practically half a wild bird, and give them just that mixture of care and neglect that meets the case.

During the hot weather farmers will do well to see that shelter is provided for their chickens and young poultry stock. If left out in the sun, they must inevitably get a set back from which they will never really recover.



## OLD HENS.

A common complaint amongst those who keep fowls as an adjunct to the farm is, that the birds do not lay a fair number of eggs. It is remarkable how such persons stand in their own light as regards the management of their poultry. They will persist in keeping their old hens year after year, instead of keeping early hatched pullets. We have repeatedly noticed that farmers who are offered a good price for pullets promptly sell them all off and retain the old hens. This simply means that the nearly worn-out old birds either stop laying for two or three months, or, if they do lay, only produce from two to three eggs, and then start to sit. Now, supposing that they were to sell off these practically useless hens at even 1s. each, they would be really saving money. For, supposing a man has forty old hens, costing, say, 2s. each for corn, he is actually paying at the rate of 2s. a head for them, and getting no return for his outlay. Now, suppose, further, that these forty old birds are disposed of, and forty pullets kept. If they are anything like worth keeping, they will pay for their keep twice over, and, in the same year, will be worth double as much as the old useless hens.

Why should the poultry-keeper act differently to the dairy farmer? We do not find them sticking pertinaciously to old cows. If the cow neither gives sufficient milk to pay for its keep, nor puts on flesh, what does the dairyman do? He just puts her in the market and sells her for what she will fetch, and in so doing he is a gainer. Let the poultry-keeper do the same, and he will not have to complain that poultry do not pay

---

IN-BREEDING.

In-breeding is recommended by many writers, and especially for show purposes. The theory has been advanced that the wild birds in-breed, and yet they are healthy. In many instances this is right, but it must be remembered these birds only lay in the spring and summer, according to their nature.

Poultry people keep their birds to lay eggs during the autumn and winter months, which is quite a different matter. If we domesticate our fowls for our convenience, then we must breed and treat them accordingly. If we are going to breed for show, then it is wise to do a little in-breeding, but not to the extent it is recommended; if so, their constitutions are undermined.

We have experimented with in-breeding in every variety, and some stand it much better than others. Take, for instance, a man who in-breeds his poultry for show purposes. Say, he breeds seventy fowls; he picks out just the strongest of the young ones, not more than fifteen or twenty, to breed from in his own yard, and more often not half that number.

It is a frequent thing to hear breeders say of pure birds, talking of others' stock, and we hear the remark especially at shows, "Yes, that exhibitor has some real good birds; but he in-breeds too much." The answer to that is usually, "How do you know that?" The reply is, "We once bought a stock bird or birds from him, and they soon died, as they had no stamina."

There are hundreds who do the same. We once knew a poultry-keeper who bought all his stock birds from people who win at most of our shows—that is, the small birds, which are usually called the "culls." These were all bought cheap, and what was the result. Out of very nearly 500 pullets, upwards of 100 wasted away, and the others did not average sixty eggs each during the year. The poultry-keeper came to grief, and the money was lost.

If eggs or good table birds are required—that is, good strong table birds—the stock must not be in-bred; if so, the birds do not fulfil their mission. Those who write articles on in-breeding do a great deal more harm



to the utility poultry-breeders, as they write that they can in-breed and yet do well. In one way it pleases them, because they need not yet buy fresh male birds, but it is misleading to those who do not know any better.

We will take our readers back to the farmers of twenty years ago, when the whole village would not have fresh blood for years. The system was for farmers' wives to exchange male birds about every two or three years with each other.

What was the result? In many cases they did not breed a chicken until the end of spring, and not many of them before the middle of summer. The simple reason was they could not get a hen to sit before that time.

We can well remember the time when farmers did not have a single egg for three or four months during the autumn and winter. (1) Because they in-bred. (2) They bred from mongrel cocks. (3) They made no selection of their stock, partly because they fed them on the very poorest of grain, such that the millers would not grind for their pigs.

Fortunately, these last few years farmers have treated their fowls differently. What brought them to do so? Bad times, and the purchase of fresh blood; they gave the birds better food, and what has been the outcome of it all? They have made better prices for their poultry and eggs, and find there is nothing pays better on the farm than poultry.

General in-breeding with ordinary stock kept for utilitarian purposes is a step backwards, and it means loss and disappointment.

It must be remembered there are poultry-fanciers who keep birds for show who do not get eggs in winter, and in many cases they keep a number of mixed birds of all kinds to lay eggs for their own consumption. But when people keep prize birds of the up-to-date utility breeds, they lay eggs all the autumn and winter.

This is one reason why the Orpington varieties have spread so marvelously fast as show birds.

We always recommend our readers to take up the newer breeds because of fresh blood having been used, and the introduction of this always means added inactivity to the egg organs.

When they complain that new varieties are not good layers, it is the fault of those who have handled them.

There is no specific way to make hens lay. Many things will tend to increase the number of eggs laid. Volumes have been written upon the subject, and each writer lays special stress upon his or her remedy. We cannot go into detail, but will give a list of the help recommended, and our readers can try the ones they think most applicable to their own case:—

1. Certain birds lay more eggs than others.
2. Young hens lay better than older ones.
3. Certain individual hens have the laying capacity more highly developed than others.
4. Green food tends to make them lay.
5. So does green bone cut up and mixed with their food.
6. So does cooked meat.
7. So does a variety of mixed food.
8. Red pepper mixed in the food.
9. Clean water every day.
10. Clean quarters or hen-houses.
11. Food given in straw or leaves to make them scratch for it.
12. Everything that you can do to have them in prime condition and perfect health.—“Farmer and Grazier.”

## The Orchard.

### GRAPES FOR EXPORT.

A very interesting and important experiment has been lately carried out, through the courtesy of the Agent-General for Victoria in London, Mr. Taverner, at the instance of Mr. H. H. Davey, editor of the "Fruit World of Australasia." Recognising the as yet undeveloped prospects in the matter of grape export, that gentleman decided to obtain a sample of the Spanish export grape from Spain for the benefit of growers, and accordingly wrote to Mr. Taverner in August, 1908, asking if it would be possible to obtain through the latter's good offices one of the usual export barrels of Almeria grapes. Mr. Taverner promptly responded by at once consigning a keg of these grapes to Mr. Davey, care of the Victorian Minister for Agriculture.

The "opening ceremony" was performed on the 8th December at the Government cool stores, in the presence of Mr. Duffus, secretary for agriculture, the viticultural expert, Mr. F. de Castella, Mr. J. G. Turner, chief inspector of fruit, and Mr. H. H. Davey, editor of the "Fruit World of Australasia," representatives of the daily and weekly Press, a good number of city fruit merchants, and others interested.

The barrel was made of oak staves, the timber used by the Spaniards for shipping first-quality grapes, and the gross weight was 60 lb. The empty cask, which measured 15 in. diameter by 16½ in. deep, weighed 12 lb., the cork dust 8¾ lb., and the grapes over 40 lb. This was slightly under the weight expected, but allowance has to be made for evaporation. The grapes, which were of the variety Ohanez, were opened up in splendid condition, only one bunch showing any signs of decay. Their carrying power may be better estimated when it is known that the keg was carried as ordinary cargo from Spain to London, and then from London to Melbourne, there being no need for refrigerated chambers.

In speaking of grapes, the word "Almeria" must not be misunderstood. Almeria is a coastal district in southern Spain, and many varieties are grown there, but of them all the best carrying grape is the one now under review—viz., the Ohanez.

People on the other side might as well speak of "Tasmanian" apples, which would convey nothing but a general meaning, because Tasmanian apples are made up of many varieties; but if we speak of "Jonathan" or "Sturmer" apples from Tasmania, the meaning is at once clear. Equally so, the term "Almeria grapes" is a general one, while the variety which has these unique carrying qualities is the "Ohanez," or, to be more correct, the "Casta de Ohanez." In appearance it is not unlike both the "Waltham Cross" and the "Lady's Finger," though somewhat smaller than the latter.

Everyone present was delighted with the experiment, which is in reality an object lesson to Australian growers, and is sure to pave the way to further developments; at least, we hope so. Why should not the grower of wine grapes, make an adjunct of grapes for export? Why not the grower of, say, Gordos, have his hand on three things in case of failure in one or two—viz., dried fruits, export fruits, and wine production?

The fruit, as illustrated, is very handsome, the flesh is firm and sweet, and when sampled the taste was as fresh and pleasing as if picked the same day; in fact, the bloom was still on the fruit, though picked twelve weeks. Besides its high quality and carrying powers, it also has the distinct advantage of being mould-resistant. According to Mr. de Castella, this variety ought to thrive in Victoria and South Australia, where the air is drier than that of Almeria. The climate of Mildura is specially suitable, because the



resistant qualities of the Ohanez would be equally well developed. The advantage to Australian growers would be the obvious one of being able to place the fruit on the markets of the other side of the world when Spanish grapes would not be available. Prices range from 8s. to 13s. per barrel of 53 lb. net in London.

No less than 2,500,000 barrels were despatched from Almeria to London, America, Germany, and other parts of the world last season.

No treatment of any description is applied to the grapes before shipment. They are simply picked and packed. The fruit, however, is usually gathered rather on the unripe side. It completes its maturity while in the keg amongst the "serim" or granulated cork in which it is packed. In Almeria the grapes ripen about October, but the packing and shipping go on until the end of December, and even much later, as this grape hangs well.

This period would mean from April to July and August in Australia.

The packing in barrels is not essential. It certainly is an advantage to have a package with no corners, and the barrel or keg is very convenient in many ways. The Spanish growers are conservative, but in this instance their conservatism is not misplaced, as they get excellent returns. Still, if in Australia we did not copy the Spaniard in this respect, we could doubtless provide a very good substitute. The barrels are made of oak, chestnut, and pine, according to the quality of the fruit, the best being put up in oak. The standard size of the barrels is 22 in. stave by 12 in. at the bung. The price of the oak barrel is about 2s.; the pine barrel is cheaper. The granulated cork is very cheap, being milled from the waste. There would be no difficulty in Australia in obtaining this commodity.

A recent report from London reads as follows:—31st October, 1908: Grapes.—Almeria are fine, but there is an absence of fine fruit, all parcels showing waste; ordinary are 7s. to 9s.; selected, 9s. 6d. to 12s.; fine, 13s. to 15s.; finest, 16s. to 20s. This is from 2d. to over 4½d. per lb. wholesale.

On being interviewed in reference to the shipment of Almeria grapes, Mr. J. M. Jacobs, of the firm of Geo. Lister, Western Markets, Melbourne (and of the family of Garcia, Jacobs, and Co., and Edward Jacobs and Co., Covent Garden, London), said—"As far as Almeria grapes are concerned as a market commodity here, I am inclined to think you won't do much good unless it be in the way of a novelty, for this reason: That they would come on to our Australian market when strawberries, cherries, and other summer fruits are plentiful.

"It is very well in England, where the need of winter fruit in the way of grapes is felt, for they come upon their market when there are no summer fruits available; but in Australia it is different.

"I have always advocated for years the bringing in of the Almeria grape vine, for the purpose of marketing the fruit across the sea.

"It would not necessarily mean adopting the barrel for packing if we can find among our hardwoods something that will hold tightly together and keep out any moisture or cold air. And we could then use in our own cases the granulated cork which we saw when unpacking the barrel of Almeria grapes.

"The question of importing the vine which grows this variety should receive immediate assistance from the Agricultural Council, but care should be taken in the selection of the vineyard, as soil and climate influences will have to be reckoned with. There is no doubt that the Almeria grape will carry to Australia—that has been clearly demonstrated to us in this instance—but so have oranges and lemons carried to Australia from Italy, and yet



we cannot land an orange or a lemon to a certainty on the other side. It is clear, to my mind, that we must have hardy varieties of fruit if we intend exporting afar.

"Varieties in Australia are well suited to their own markets, but totally unsuited for export.

"South Australia exported grapes, putting them in the Covent Garden market in a more or less good condition, while others had arrived 'dead rotten,' and this disheartened the exporters to a very large extent. But I look to this Almeria grape (if it can be cultivated in Australia with the same tough, hardy qualities as in Spain) for a big development in the export grape trade from Australia, and even as apples carry with great certainty now, producing a big trade, we may look forward at no far distant date to seeing the Almeria grape from Australia on the Continental and English markets.

"In London the grape has been known to keep in the cellars under the market stores at Covent Garden for a period of anything between a month and six months. I am not going to say that after a lapse of six months the grapes will not require to be picked over to cull out the bad, but grapes have kept for six months under these conditions, and although the atmosphere there at this time of the year is different from that in Australia, we can bring cool stores to our assistance.

"The grape export from Spain to England has been going on for the last fifty years. A small syndicate of Covent Garden men, under the direction of Ben Symons, were the first promoters, and subsequently Michael Symons, formerly a Glasgow baillie, organised a regular carrying fleet for the promotion of this industry, carrying between the grower in Spain and the consumer in England. There were times when enormous profits were made. Since then the trade has gradually settled down, and although some of the grapes are sold at Covent Garden, the majority find their way to Pudding lane and Monument yard, where the dried fruit auctioneers hold sway. The estimated value of this fruit in England is somewhere between 6s. and 15s., according to condition and sample. The barrel is always used, because it is the most air-tight article that the trade can use for the purpose. I hope the Council of Agriculture, having put their hand to the plough, will go further, and import the vines of this variety, which will enable Victoria and other parts of Australia to compete successfully with grapes in the world's markets, as has been done with other fruits."

Amongst those present at the "opening ceremony" of the keg of Almeria grapes was Mr. F. Thomas, of the firm of Thompson, Thomas, and Co., King street, Melbourne. This firm has had considerable experience in the shipping of grapes, the bulk of it, however, being done through their London house. Their experience has confirmed them in their opinion that this "Ohanez" (Almeria) grape is the only safe variety for shipment. Large quantities are sent to Ceylon and the East between the months of September and December. The method of shipping is the same as has already been described—viz., the packing in cork-dust in kegs. The grapes are shipped as ordinary cargo.

Of course it is not impossible for even this excellent variety to miscarry, but the error would be through faulty picking, over-ripeness, or bad stowing aboard ship. The Australian grapes have not got that thick, tough skin necessary, but of our many varieties Mr. Thomas thinks the Doradilla the best. If the "Ohanez" (Almeria) grape were cultivated here, it would have a grand future as regards export, as the grapes from here would be placed on the English and Continental markets when there would not be a Spanish grape available, our grape season being in full swing in March.

Mr. de Castilla, it is reported, brought cuttings from Europe of the variety under notice, and these are now being propagated at Rutherglen (Vic.).



## CORK WASTE.

Cork waste for the packing of grapes for export appears to be available in large quantities in Melbourne, Messrs. Vogt Bros. having stated that they hope to be able to supply many tons of granulated cork, the waste from their factory, should there be a demand for the article amongst fruit-growers.

In this connection, some account of the cork industry in Southern Europe will prove of interest, especially as portions of all the States of the Commonwealth of Australia would seem to be well adapted climatically for the growth of the valuable cork oak (*Quercus suber*).

Mr. François de Castilla, of Melbourne, who recently visited Southern Europe on a viticultural mission, writes as follows on this subject:—

“It was in Portugal that my work brought me most in contact with this remarkable tree, which is in several districts of that country cultivated in close proximity to vineyards. In Spain the chief cork-producing regions were not sufficiently remarkable from a viticultural point of view to cause me to visit them. Most of the information I have collected is, therefore, derived from Portuguese source.

“The Peninsula is no doubt the home of the cork oak. I understand there is quite as large an area in Spain as in Portugal, and that results are equally remunerative. In Algeria large cork forests also exist, and, though I am not in possession of statistics as to extent, I understand that they are very profitable and yield an excellent return on the money invested in them.

“Even in the South of France, cork forests are to be found, but the climate (colder than that of Australia) is not so suitable as that of the Peninsula.

“Portugal possesses, in 1900, 525,000 acres devoted to the cultivation of this tree. In that year the cork produced amounted to 50,000 tons, of a value of 3,671,736,000 reis (equivalent, at par, to £814,290 of our money). In other words, the cork forests of Portugal yield on an average over 30s. per acre per annum. The best established and best cared for plantations yield, of course, a far higher annual return.

“The above figures are exclusive of the value of the acorns produced, which in itself amounts to a considerable sum. The acorns constitute excellent pig feed, though in this respect the cork oak (*Quercus suber*) is less productive than the *Quercus ilex*, another form of evergreen oak. It nevertheless produces large quantities. About half a century ago the *Ilex* was, on this account, more popular; but, owing to the increasing demand for cork, it is now being largely replaced by *Quercus suber*.

“Statistics show the importance of the acorn crop of these two oaks in Portugal. Out of 1,000,000 pigs raised each year in the country, it is estimated that 300,000 annually are fattened on acorns. Many land-owners fatten their own pigs, but in many cases they graze them, some pig-owners paying as much as 30s. per head for the season.

“Even the timber of this remarkable tree is of value, but, it being very long-lived and regularly productive, it is seldom used for this purpose.

“Our Victorian climate should prove exceptionally suitable for it. The Portuguese consider the part of their country south of Lisbon to be its true habitat. The way in which our Australian trees—gums, blackwoods, and she-oaks—flourish near Lisbon, where they are largely planted, leaves no doubt as to the suitability of the greater portion of Victoria for cork culture.

“The chief cork-producing districts of Portugal are those of Beja, Evora, Portalegre, and Algarve. One also sees large plantations in the valley of the Tagus, on the railway trip from Oporto to Lisbon. The trees receive no cultivation, though the ground is kept clear of scrub and rubbish. Suckers are usually removed to let in air, and also to promote the formation of acorns for pig feed. Of all forest trees grown in Portugal, it is the one which is best looked after, and which yields the most handsome returns.

"The first crop of cork is usually obtained at the age of fifteen years or so, though the bark for tanning purposes is often removed at the age of four years. When in regular production, the trees are stripped every nine or ten years, it being customary to strip one-tenth of the plantation each season, a regular and uniform annual production being thus ensured. Stripping is usually performed between the 1st June and 30th August (1st December and 30th February in Australia), the operation being performed in much the same way as we remove a sheet of bark from a stringybark tree. The appearance of the trunks, after removal, is very striking—at first of a vivid orange-red colour, they become gradually darker until quite black. Though the bark is entirely removed from the trunk, as deep as the cambium layer, no injury seems to be done to the tree, which immediately sets to work to grow a new bark.

"Rich soil is not essential for the culture of cork. On poor soil, though the growth is slower, the quality is usually superior. I have seen large plantations in poor sandy soil, of little value for agriculture. I feel sure we possess large areas of poor land in Victoria excellently adapted for the cultivation of this valuable but neglected tree."

---

### NEW BORDEAUX MIXTURE.

At the Woburn (England) Experiment Fruit Farm investigations have shown that the clear lime-water made by slaking 3 lb. of quicklime in about 100 gallons of water, and then adding 86 gallons of this clear solution to 14 gallons of water in which 6 lb. 6½ oz. of copper sulphate have been dissolved, will yield 100 gallons of Bordeaux mixture superior to and cheaper than that made according to the commonly accepted formula. As our ordinary commercial forms of quicklime vary exceedingly in its essential constituent—viz., calcium oxide—the potassium-ferro-cyanide test becomes essential if anyone is disposed to give this formula a trial.

---

### FRUIT CASES.

A report from South Africa states that £3 15s. is being paid for *Pinus insignis* trees, about eighteen years old. Presuming they had 200 of these trees on 1 acre, they would obtain a return of £30 a year for eighteen years. A Mr. Newmarch stated that he was making boxes with wattle wood. It had been brought to his notice that the ends of the boxes would have to be made with a soft wood. He decided to try *Pinus insignis*, and, as some of these trees are growing on a neighbour's property, he obtained permission to cut one down. He found the wood very suitable for what he wanted, and had paid 9d. a cubic foot for the wood, which totalled £3 15s. for the tree. Many people did not consider it worth while to grow this tree, as it generally died when seventeen years old. He had found the wood as soft as deal, and as good as the best deal. He considered that 200 of these trees could be grown to the acre, and he thought that there were few crops that would give such a return. A Colonel Crompton stated that he had had experience with these trees, and, though he did not wish to depreciate the *Pinus insignis*, he thought the *Pinus pinaster* would do better. It grew splendidly, though more slowly.—  
"Fruit World."

---

### BEATING THE FRUIT FLY.

Mr. W. J. Allen, Government Fruit Expert, New South Wales, says that the inspectors under the Fruit Pests Act are not averaging one specimen of the fruit fly a week, whereas last year thousands could have been found daily. There has been no fly in apricots or peaches so far, though an occasional one



may be expected from now on. "The way the people are working," says Mr. Allen, "has helped to keep the pest under. If they keep on fighting it, I am satisfied that we won't have much fly, except on the Northern Rivers, where not a great deal of fruit is grown. The majority of growers are doing their best to carry out the work of destruction." Mr. Allen is of opinion that there is something in the season that has proved even a more important factor than the preventive and suppressive measures taken under the Act.

### A NEW MANGO.

Amongst the new fruits which are under experimental culture by the United States Department of Agriculture is a mango of Indian origin, known as the "Sandersha" variety (says the "Agricultural News" of Barbados), first introduced into Florida in the year 1901, and of which the following particulars are given in an article in the departmental Year Book (1907), with coloured illustrations:—

Of the mangoes that have so far fruited sufficiently in Florida to disclose their distinctive characteristics, the Sandersha is one of the most unique, and in certain respects the most promising. It was introduced by the Section of Seed and Plant Introduction in 1901, having been received from Bangalore, India, in the form of two inarched trees. A second lot of inarched trees received from Mr. W. Gollan, Superintendent of the Government Botanic Station at Saharanpur, India, under the name "Sundershah," has not yet fruited, but is believed to be the same sort. Little appears to have been published in India regarding the variety, but at the Subtropical Laboratory of the Department at Miami, Florida, where it has been fruited for two seasons, it has proved very productive, of exceptionally large size, fine dessert quality, and very late ripening season, all of which points are apparently in its favour as a commercial sort. Mr. P. J. Wester, of the Subtropical Laboratory, considers cross-pollination necessary to insure productiveness.

The Sandersha mango is long in form, compressed, and rather slender, tapering toward stem, and terminating in a distinct curved beak at the apex; size, very large, averaging about 20 oz. weight, and occasionally attaining a weight of 2 lb.; stem stout, apex prominent, curved and "beaked"; surface smooth; colour clear yellow, with a faint pinkish blush in the sun; dots numerous, small, russeted; skin moderately thick; seed long, curved, thin, small in proportion to size of fruit and thickness of flesh; flesh rich reddish-yellow, juicy and tender, almost entirely free from fibre; flavour refreshing in the fresh state, though with rather less aroma than the Mulgoba. Its higher acidity will doubtless render it more acceptable for serving in sliced form than are most of the mangoes thus far obtainable in the United States' markets. This mango is a late variety, ripening in the latter part of August at Miami, Fla. The "Sandersha" is considered well worthy of testing in the mango districts of Florida, Porto Rico, and Hawaii.

---

### THE MARKET FOR FIBRES.

From the "Journal d'Agriculture Tropicale" we take the following prices for sisal and other fibres. It is satisfactory to learn from that journal that since the slump in June last, when the price of sisal fibre dropped to £25 per ton, prices have gradually risen, and also that there is an increasing demand, which must result in much higher prices during the next few months. Sisal is quoted at £29 17s. 4d., ixtle at £23 12s. 10d., Mauritius at £22 16s. 6d., ramie at £31 18s. 9d., and Manila at £36 1s. 9d. per ton. It should be noted, however, that these are top prices for the best samples.



## Apiculture.

### AUSTRALIAN HONEY IN ENGLAND.

From the "Journal of Agriculture" of Western Australia we learn that little, if any, profit is to be derived from exporting honey to England. During the year 1908, the Beekeepers' Association secured the assistance of the Department of Agriculture to send to London a shipment of West Australian honey, in order to test the market. This step was prompted by the unsatisfactory position of the honey industry in that State.

It is said that, except during seasons when natural blossoms are peculiarly scarce, the State demand for honey is fully met, and, for want of some sort of organisation, sellers so cut down prices that wholesale merchants are not able to offer to producers a price which will induce an increase of production. On the other hand, indiscriminate exportation in the past has given to Australian honey in England a bad name, which has been used by large dealers connected with the honey trade to work their own ends.

For the purpose of promoting a more favourable appreciation of West Australian honey, a consignment, specially collected by the Beekeepers' Association, was sent to the Agent-General in England. A request was, at the same time, made to have that honey put up in attractive form, and placed on the market. It was thought that the West Australian Court would materially help in this work of distributing the honey in conjunction with others specially conversant with the trade.

The result, as reported by the Agent-General, has been anything but satisfactory, and, instead of the anticipated prices of 4d. to 5d. per lb., the consignment was sold at 15s. per cwt.

The average price of honey imported into the United Kingdom last year was about 25s. 6d. per cwt., French honey selling at 50s. per cwt., West Indian 22s., and the United States between the two, with an average of 26s. 6d.

Altogether the imports into the United Kingdom from all sources only amounted to the small total of 26,354 cwt., valued at £33,397.

---

### BEE NOTES.

The hon. secretary of the Queensland Beekeepers' Association (Mr. G. Butler) forwards the following bee notes:—

Mr. F. C. Golder, of the Grange Apiary, Pittsworth, writes as follows:—

"Honey is now coming in freely from lucerne, which is blooming profusely and producing a lovely flavoured honey. Prickly pear comes out in bloom early in November, and continues for about a month. I consider it one of the best honey-producing plants we have for building up the colonies, as it produces both pollen and honey in large quantities—in fact, I find no other honey plant to come anywhere near it for stimulating the bees. The honey is nearly as white as that produced from lucerne, but it has a distinct flavour of its own, also it is of a cloudy appearance. The one objection I have to it from a commercial standpoint is that it granulates very quickly; in fact, even in mid-summer it will become solid within a week of being extracted. There is no doubt it would be a honey of first merit for selling in brick form, as it will remain solid at a temperature of 100 degrees Fahr.; but, as I mentioned before, we only get a very limited quantity, as the bees use the bulk of it for brood-rearing. Should you require a sample in its purity, I will be pleased to forward same for analysis, to refute the statement that has been published—namely, that prickly-pear honey is of a rank flavour, and not fit for human consumption."

Mr. Golder is one of Queensland's up-to-date beekeepers. In order to cope with his increasing apiaries, he has been compelled to instal an 8-frame reversible honey-extractor, and a 1-h.p. gasoline engine to run it. It has been imported from the A. I. Root Company, through their local agent, Mr. H. Jones, of Goodna. It is capable of extracting 1 ton of honey per day.



## Sericulture.

### ERI SILK.

In our description of the various kinds of silkworms in the November number of the Journal (1908) will be found a reference to the Eri multivoltine silkworm. We are now enabled to place before our readers further information concerning this valuable silkworm, contained in a pamphlet on Eri silk, by Anukul Chandra Roy, in the Bengali language, a translation of which was supplied by the assistant to the officiating Director of Agriculture, Bengal, to the Ceylon "Tropical Agriculturist," and appeared in the December (1908) issue of that journal. Following is the translation:—

The writer principally gives suggestions regarding the method of rearing Eri worms. He begins with stating the profitableness of the Eri silk culture. He says formerly Eri cocoons used to be sold at Rs. 50—60 per maund; but now they are sold at Rs. 100—150 per maund; also pure white cocoons fetch higher prices. The rearing work can be done by the female members of the family, without any interference with the household duties. The worms feed only on the leaves of the castor plant, and the seeds can be readily sold in the market.

Castor plants should be grown about a year before the rearing work is taken in hand. When the castor is ready, a bamboo machan with three or four shelves is to be prepared in a room or veranda, when it is proposed to carry on the work on a small scale; when a large number of worms is meant to be reared, a separate house has to be built. A few bamboo trays and baskets are to be secured. The trays, baskets, and shelves are to be washed with a 1 per cent. solution of copper sulphate. Ants, birds, frogs, and wasps are great enemies of the worms. In order to prevent these, a fence is necessary round the machan; also the following compound is to be painted round bases of the posts of the machan:—

Castor oil, 1 seer; resin,  $\frac{1}{2}$ -seer. Boil, and then add 30-40 drops of the milky juice of Calotropis.

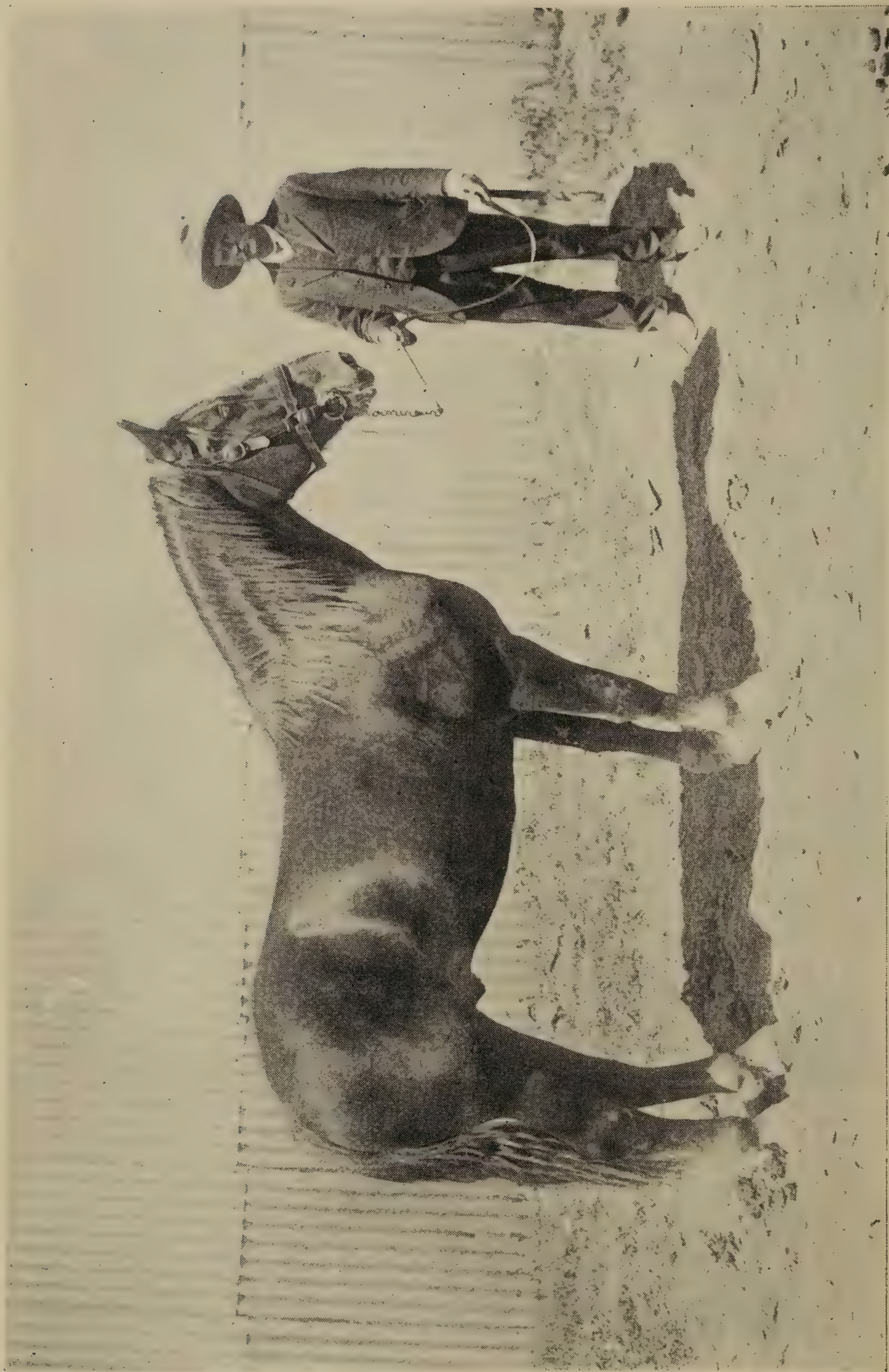
After these are ready, eggs can be got from Assam; or some seed cocoons can be got and eggs secured from the moths which will emerge. The eggs are to be dipped in the copper sulphate solution, dried in the shade, and then kept spread for hatching. They will begin to hatch in eight or ten days in winter, and earlier in summer.

The young worms soon crawl up to the tender leaves of castor, which are to be placed on them at noon, and can be easily transferred to a separate tray. The worms of the first day are to be paced on the lowest or highest shelf, and those of the next three days (collected every day at noon) on the next higher or lower shelves in order. The eggs can be thrown away after the fourth day, as by that time all will have hatched. Until the worms are about 1 in. long, young leaves are to be cut into small pieces and supplied as food. In order to bring up the worms of the different dates to an equal growth, the worms of the first day are to be fed three times a day, those of the second day four times, and those of the third and fourth days five times a day. After four or five days all the worms will be found to be of an equal size, and they can then be mixed together. They are to be fed five times during the day and night—at 6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m.—until they are ready to spin cocoons. Every day the trays are to be cleaned. The worms moult four times, and should not be given food while they are moulting; also they should





*Plate XVII.*



IMPORTED SUFFOLK STALLION, GLENTHORNE MONARCH.



not be fed with wet or dusty leaves. They spin cocoons in about fifteen to twenty days in summer, and in about twenty-five to thirty days in winter. They can be made to prepare cocoons either (1) in the small chambers of a chandraki specially made, or (2) in the angles formed by two or three sticks tied in the middle in a branching manner, or (3) in a mass of dry plantain leaves or papers. After three days the cocoons are to be picked out and kept in a basket. The moths are to be allowed to escape from the cocoons.

For seed, those cocoons should be selected which are (1) white, (2) big, and (3) formed by the most active and restless worms.

The cocoons are boiled in ashes and water or in a solution of washing soda. They are then washed with cold water and dried: and then carded and spun into thread like cotton lint.

Statistics.

COMMONWEALTH METEOROLOGY.  
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.	1908.											
	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
<i>North.</i>													
Bowen ... ..	6.39	10.14	5.63	9.46	3.73	0.99	0.45	0.88	0.51	0.96	2.47	0.42	0.42
Cairns ... ..	28.33	27.02	8.03	20.60	5.99	3.05	0.59	3.70	2.12	0.74	3.07	1.60	1.41
Geraldton ... ..	33.82	44.39	13.27	39.00	14.23	18.52	2.64	8.11	3.66	2.81	6.93	3.80	1.69
Gindie State Farm ... ..	4.42	0.20	7.17	6.25	0.02	0.112	...	0.40	1.27	...	...	...	...
Herberton ... ..	9.57	9.29	5.02	8.92	1.40	0.38	0.31	2.36	Nil	0.51	1.27	0.61	0.78
Hughenden ... ..	7.75	0.98	5.18	6.91	0.30	Nil	0.05	0.68	Nil	Nil	1.67	1.94	1.05
Kamerunga State Nurs. ... ..	29.82	...	7.47	25.75	4.60	3.363	0.76	4.85	1.58	...	3.64	1.69	...
Mackay ... ..	9.70	9.28	3.83	17.43	14.82	3.25	1.29	1.65	0.71	2.27	1.80	2.57	0.2
Rockhampton ... ..	4.42	3.84	9.64	9.77	2.62	0.85	0.10	1.08	0.84	0.20	2.14	2.47	1.37
Townsville ... ..	24.26	12.21	6.69	9.03	0.38	2.22	Nil	1.70	0.27	0.28	1.58	1.26	0.7
<i>South.</i>													
Biggenden State Farm ... ..	5.55	2.37	9.82	9.84	2.97	0.74	0.43	0.49	2.33	1.39	1.80	2.12	3.66
Brisbane ... ..	3.21	2.80	8.43	18.19	2.45	2.40	0.17	0.77	2.83	0.67	1.77	2.25	1.28
Bundaberg ... ..	2.99	4.77	2.82	7.35	4.13	0.67	0.39	0.75	1.56	1.10	2.39	0.73	3.34
Dalby ... ..	1.44	0.17	4.88	7.61	0.11	0.37	0.63	0.14	1.80	1.13	2.55	3.65	1.56
Esk ... ..	3.72	2.61	10.06	17.04	2.83	1.07	0.23	0.46	2.75	2.16	1.29	5.99	3.62
Gatton Agric. College ... ..	4.55	...	3.38	10.74	...	0.10	0.16	0.6	2.71	1.84	1.93	5.71	1.29
Gympie ... ..	5.49	6.26	11.77	8.08	1.87	2.00	0.38	1.16	2.87	1.37	2.49	2.58	3.97
Ipswich ... ..	3.40	1.32	6.63	13.77	2.71	1.14	0.12	0.47	3.23	1.19	1.48	5.09	1.05
Maryborough ... ..	5.81	5.62	8.07	11.40	2.52	1.05	0.46	0.81	1.98	1.05	1.84	1.92	1.64
Roma ... ..	2.51	0.04	6.38	2.51	0.22	Nil	0.55	0.63	1.38	1.12	2.15	2.79	1.68
Roma State Farm ... ..	...	...	...	...	...	...	...	1.27	0.73	...	...	...	...
Tewantin ... ..	7.36	10.42	12.47	14.39	7.59	8.66	0.75	1.97	2.70	2.18	2.30	7.50	4.12
Warwick ... ..	3.13	0.76	4.52	6.65	1.40	0.15	0.80	1.24	2.99	1.96	0.96	5.28	2.02
Westbrook State Farm ... ..	3.23	0.43	8.03	1.41	1.40	00.5	...	0.49	1.97	...	...	2.05	...
Yandina ... ..	3.05	8.37	14.47	16.62	5.45	4.59	0.58	2.64	2.18	1.50	3.10	6.03	2.75

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,  
Divisional Officer.



# Horticulture

## FLOWER GARDENING—No. 13.

### PLANTS SUITABLE FOR IN AND OUT DOOR CULTURE.

By THE EDITOR.

#### MIMULUS.

This is often called "Monkey Flower." The Mimuli are extremely handsome, profuse-blooming plants, with singularly-shaped and brilliantly-coloured flowers, distinguished by their rich and beautiful markings. Sow the seed from March to May, in light soil, scarcely covered.

The Musk Mimulus and Harrison's Musk are well-known greenhouse plants. The roots of these, like those of mint, run under the surface of the soil, which, by continually watering, loses the nourishment so essential to the plant. Cuttings, well grown, make much better plants than those obtained by division of the roots. Plant a vigorous young cutting, well rooted, in about 4 in. of a rich compost at the bottom of a good-sized flower pot. It will grow rapidly. Then pinch out the leader, and as it grows, add more soil till the pot is filled to within 1 in. of the top. By this time, the pot is well filled with roots which have struck out from all parts of the plant thus buried; hence it grows more vigorously. Now place several sticks 2 in. apart all round the edge of the pot; draw and tie them together at the top, thus forming a cone 18 in. high. As the plant grows, put bands of fine matting round the sticks to keep the foliage inside. As the flowers appear, remove them until the trellis is nearly filled; then let it bloom at will. Now let the shoots come through the trellis and fall down round the pot, which will soon be almost invisible. The whole then represents a most beautiful pillar, 2 ft. high, covered with flowers of a larger size than commonly seen on Musk. Musk grown after this fashion never fails to carry off prizes at flower shows.

#### VARIETIES.

M. Clapham's Superb, remarkable for the great size and superb colouring of the flowers, and vigorous habit. M. Queen's Prize: Many of the flowers of this variety measure 2 to 3 in. in diameter, the colours comprising mottled shades of rich purple, crimson, and yellow, ruby, &c. *M. tigrinus albus*, white grounds handsomely tigred and spotted; *Grandiflora*, and *Moschatus* (Musk).

#### CANNAS.

Of all our tall-growing showy plants the Cannas are the easiest to cultivate. Under the name of "Indian Shot" they have been grown for many years in most flower gardens in Queensland; but of late years the old varieties have become quite obsolete, a new, and far more ornamental, species having taken their place. The Canna of to-day is one of the most beautiful of our decorative plants. They are quite hardy, nearly always in flower, and have fine foliage, like the leaves of the banana, only pointed. Cannas are not at all particular as to soil or situation. They form a very numerous genus, between the several species of which there is so great a similarity that it is needless to retain in the garden more than half a dozen of the best. They all have large lanceolate leaves, grow from 3 to 5 ft. high, and are apt to become exceedingly troublesome by throwing up suckers for a great distance around. They are easily propagated by division of roots or by seed. It is from the *Canna edulis* that Queensland arrowroot is made.

## VARIETIES.

Africa, flowers resemble those of the Cattleya Orchid, a rich purple scarlet, golden yellow and orange inside; *Alemannia*, the giant flowering Canna, outer petals scarlet, with a rich golden border, inside of blooms scarlet; Aphrodite, grows to a height of 6 ft., flowers golden yellow, with large salmon-coloured spots; Atalanta, flowers orange-carmine; Austria (Orchid-flowered), flowers large, compact, of a beautiful canary-yellow colour. Other beautiful varieties are—Asia, Bavaria, Burbank, Burgundia, Charles Naudin, Edouard André, Emperor, and the Dwarf Fairy.

SUNFLOWERS (*Helianthus*).

This well-known annual thrives well in Queensland. Some of the tall-growing varieties attain a height of from 6 to 8 ft. with flowers of enormous size. The small-flowered varieties—Stella and Cucumerifolius—are most decorative and useful for cutting. It is one of the best yellow summer annuals. Seed should be sown in the Spring and Summer.

## VARIETIES.

Russian Giant, Silver Queen, Double Miniature, Stella, Orion, *Nana compacta*, Cactus-flowered (resembling the cactus dahlia), New Red Perennial. This latter attains a height of 6 ft., and has beautiful red flowers. Its great beauty is not seen until the second year.

## CLIMBING AND CREEPING PLANTS.

There is no cheaper, easier, and prettier way to decorate the exterior of a house than to have a variety of climbing vines around the porch and along the verandas. They not only provide a beautiful screen, with the green of the leaves painted by flowers of varying hue, but exclude the hot sun, and enable one to enjoy an easy chair in the open air when otherwise the sun's hot rays would render it impossible. The objection is sometimes heard that vegetation rots the woodwork which it shades, but this damage, if any, is not worth mentioning, and only calls for an occasional extra coat of paint.

## ALLAMANDA.

This is a genus of handsome strong-growing shrubs; they are free-flowering, and, with one exception, their flowers are yellow. They form splendid objects trained over balloon-shaped or other trellises, where their rich golden flowers maintain a display for several months. The soil best adapted to their requirements is a mixture of equal parts of loam, leaf mould, peat, and sand; in fact, a soil such as is found in the virgin scrubs of Queensland. *Allamanda Hendersonii* has large, handsome, yellow flowers.

## ASPARAGUS.

The shrubby species of Asparagus are graceful climbing plants, with finely-divided brilliant green leaves. The delicate branchlets are highly valued as being admirably adapted to the ornamentation of wreaths, crosses, &c.

*Asparagus Sprengerii* is a very elegant climber, well suited for hanging baskets. The foliage, as well as the fragrant, creamy-white flowers, furnishes a very beautiful material for decorating purposes.

The best soil for this plant is a sandy loam and vegetable mould.

## ASPARAGUS OR LACE FERN.

This is the name often given to *Asparagus plumosus*. When the plants seem inclined to make one long vine rather than a bushy growth, nip out the centre when the shoots attain the height of 1 ft. or 18 in. Sprouts will then



appear from the roots or the nodes of the stem. If a plant fails to grow satisfactorily, shift it into a larger pot, and add porous fibrous loam for the new roots to penetrate. The great beauty of this exquisite foliage plant warrants all the care that can be bestowed upon it. It is really one of the most charming of foliage house plants, and should be one of the first chosen. It has no enemies; its culture is simple, and its propagation is readily effected by seeds, which come up with certainty after they have been in the ground for from three to four weeks.

#### ARISTOLOCHIA.

These singular but beautiful climbers may be seen in many of the gardens in the coastal districts of Queensland. They are remarkable for the size and peculiar form of the flowers, which in some species are of great size. *Aristolochia elegans* is a beautiful bush-house or green-house plant. The flowers are borne on long stalks, having a slightly distended tube, which is bent upwards. The upper portion is cup-shaped, and of a rich dark-purple colour, with creamy white markings, and having a golden-yellow eye surrounded by rich velvety purple.

*A. grandiflora* is an interesting plant, with handsome foliage and singularly-shaped flowers. Sometimes known as the "Dutchman's Pipe."

It is a fine creeper for a wall or fence, or side of a bush-house.

#### ANTIGONON.

This is one of the most beautiful and showy of slender creepers. It bears a profusion of lovely, bright, rose-coloured flowers and bracts. The plant thrives most luxuriantly in Queensland, and will cover an unsightly fence in a very short time. The seeds which fall will generally germinate, but the best way to propagate the Antigonon is to pot the thick root stocks in a fresh, open, well-drained compost, consisting of turfy loam leaf mould. At the end of Autumn cut the plant back close to the ground. In the Spring new shoots will be produced, which will grow rapidly and run to a distance of some 50 ft.

#### BIGNONIA.

Though most of this species are sufficiently hardy to thrive out of doors, such sorts as *Chamberlaynii* (*speciosa* and *venusta*) are well worthy of a place in the green-house or conservatory. They, however, grow too large for pot culture, and should, therefore, be planted in free soil and trained up posts and rafters.

All the Bignonias are worthy of a place in the flower garden, being easy of culture, fast growers, and beautiful as well as free bloomers.

After flowering, the old wood should be cut away, and young shoots brought up to take its place. Soil containing about one-third of peat is the most suitable. Cuttings strike freely.

#### VARIETIES.

*Venusta*: When grown on a trellis or trained against a wall the *B. venusta* is unsurpassed in the profusion or magnificence of its large racemes of bright orange-coloured flowers. *Mackeni*: This is also a grand evergreen climber, and in habit and growth resembles *Bignonia rosea*, but the flowers are more veined, and much deeper in colour.

Other good varieties are—*Capreolata*, climbing to 40 ft.; *Excelsa*, 20 ft.; *Fulvia* (yellow), 20 ft.; *Jasminoides*, 20 ft.; *Latrobeii* (cream); *Lindleyana*, 15 ft.; *Rosea* (rosy-lilac); *Tweediana* (yellow), 20 ft.

#### TECOMA.

Tecoma is a genus of evergreen and deciduous climbing plants, many of which are excellent subjects for the garden. The tecoma is found native in many parts of the globe, several species being indigenous to Australia. It is



closely allied to *Bignonia*, a genus containing some of the finest climbing plants in cultivation, and at present many kinds are described in nurserymen's catalogues as synonymous with *Bignonia*. The flowers of most of the species are produced during summer, and are a feature in many gardens. They are borne in large bunches, the individual flowers being large and tubular in form, and the colour of many kinds bright orange or yellow.

The climbing kinds are useful in mixed shrubberies or borders, and are particularly effective when trained on walls or fences. The usual plan adopted is to treat the deciduous kinds as pillar plants, and the larger growing as plants to cover a trellis or to mingle with the growth of trees. The shrubs are evergreen, and although few in number are among the most suitable for small borders. They are sufficiently hardy to endure the conditions generally obtaining in cottage or villa gardens, and are bright and effective for several weeks of Summer.

Florists have not effected much improvement with the *tecoma*, few hybrids of value being noted. One of the best of these is *Tecoma Smithii*, a variety raised in South Australia, and generally considered to be one of the finest garden shrubs extant.

The most suitable soil is a light loam, but in this respect the *tecomas*—or most of them—are accommodating, thriving satisfactorily in any fair garden soil. Fine specimens may be seen in the metropolitan district, growing in soils varying from a light sandy to a heavy stiff, clay loam. Like most of our cultivated plants, they fail under sour soil conditions, requiring a drained and sweet soil, even if poor and rather dry, to produce satisfactory specimens. In poor soils, well-rotted stable manure should be incorporated to a depth of 18 in., but hot forcing manures should not be used when setting out young plants.

The Autumn is the best time to plant the evergreen kinds from pots, affording the plants an opportunity of being established before the hot and dry weather sets in. In districts where severe frost is the rule, late Spring planting is best, especially for the *grandiflora* varieties. The young plants will require to be watered and tended until established, when they will endure severe conditions without suffering very greatly. Deciduous kinds are often grown in the open ground by nurserymen. Any removal direct to the permanent positions for such kinds should be carried out in the dormant season.

*Tecomas* are propagated from cuttings of the matured growths, from roots of certain kinds—*Radicans* and its varieties, for example—and from seeds. Some kinds strike readily in winter from cuttings of the matured growths treated in the same manner as rose cuttings—*i.e.*, taken with a "heel" and inserted firmly in sandy soil in the open ground, while cuttings of others difficult to "strike" in the open are grafted on roots of the free growing kinds. Most of the *tecomas* can be readily increased by layering the branchlets, a mode of propagation frequently adopted by nurserymen. Plants are easily raised from seed if available, this being the usual means of raising *T. Smithii*, a variety which produces seed freely.

#### THE VARIETIES

most worthy of cultivation that are obtainable in this State, include *Capensis grandiflora*, *Radicans*, *Jasminoides*, *Stans*, *Guilfoylei*, *Madame Galen*, *Manglesii*, and *Smithii*.—"Journal of Agriculture," Victoria.

#### COBÆA.

If you want a good, free-climbing vine, include *Cobæa scandens*. The seeds are rather hard to start, very liable to rot in the ground unless carefully placed on edge when put in the ground. The following account of the vine is taken from "Park's Floral Magazine":—

More than one century ago, 1792, *Cobæa scandens* was introduced from the wilds of Mexico, and since that time it has been more or less cultivated



and prized as a wall, porch, and trellis vine. It is of easy propagation from seeds, and its large, graceful, hanging, purple bells, produced upon long stems which issue from the leaf-axils, are always much admired. The vine has excellent foliage with terminal tendrils, and is of wonderfully rapid growth. It becomes a favourite when its beauty is known.

*Cobæa scandens* has purple flowers; *C. scandens fl. albo* has large, white, bell flowers, and *C. San Salvador* is a magnificent climber, with foliage of a bright, vivid green, and strikingly effective flowers.

#### BOUGAINVILLEA.

The Bougainvilleas are magnificent climbers. They like a warm aspect, although they appear to thrive in almost any situation in our sunny State. Their flowers are magnificent, and they continue in bloom for a very long time. The flowers are of various shades of purple, mauve, violet, crimson, magenta, and rose-lilac. They grow easily from cuttings.

#### VARIETIES.

*Braziliensis* (bright mauve); *Conspicua* (purple shade); *Glabra* (rose-lilac); *Grandiflora* (magenta); *Hessiana magnifica* (purple); *Sanderiana* (violet red); *Refulgens* (brilliant purple mauve); *Spectabilis* (rose-lilac); *Splendens* (crimson).

#### CLEMATIS.

Of all the climbers the family of Clematis are the most refined and delicate in their growth and beauty of flower. They are true aristocrats among the climbers, but on account, perhaps, of their usually high price and the more than usual care sometimes required to start them, they are not seen as often as could be desired.

The principal causes of the failure of these plants, when young, are, in faulty potting, planting out, and cultivation, and not, as is generally supposed, in their grafting. When the graft has started into growth, the portion of the stem where the stock and the scion are joined should not be imbedded in the soil, and when shifting the plants into larger pots this junction should be raised 2 or even 3 in. out of the soil to fully expose the union of the graft, that it may become hardened, and thus form a woody texture. The practice should be the same in this respect, whether the graft be made of one-year-old wood or of new growth of the current season. Upon receipt of the plants from the nurserymen, it will be seen whether they are potted deeply, and if so the surface soil should be immediately removed in order to harden the graft. No roots will be found in the upper part of the pot, for the Clematis never forms surface roots, but they descend deeply into the ground, and this is clearly seen on removing a plant from a pot. It will then be found that the majority of the roots are in the drainage materials.

After the hardening process is complete, and this usually occupies three or four months, the plant will be ready for transplanting to its permanent quarters, or to be potted and grown as a specimen plant. Deep cultivation is essential in the case of ground intended for the reception of these plants. The soil in the border or bed must be stirred to a depth of 3 ft., and have incorporated with it leaf mould or well-decayed manure from a spent cucumber bed, sand, or fine gravel, and a goodly proportion of finely-broken, soft, red brick. Care should be taken that lime or mortar rubble in the smallest quantity is not present in the soil, as this constituent is most harmful. Allow a few days to elapse in order that the soil may settle down before planting, which should be done as near to the surface of the ground as is possible; at least 3 in. of the stock should be seen above the surface of the soil. A piece of zinc or tin 2 or 3 in. wide should be placed around the stem of the plant,



but not close to it; a space should be allowed as far from the stock as the rim of a 5 or 6 in. pot would be if the plant were placed in a pot of this size. The metal band will prevent soil from the border working up around the plant and burying the union of stock and graft. I have proved by experience that the principal cause of failure with the clematis is deep planting, instead of deep cultivation. With reference to plants already in position, and not in a thriving condition, it is recommended that the soil be removed from around their stems in the form of a basin. Place a piece of zinc around the stem to keep it exposed, and top-dress the border with decayed manure. Specimen plants growing in pots must not be potted deeply; the stock should be exposed at least 2 in. Deep pots of the "Long Tom" pattern should be used, and each season the plants should be given a top-dressing of some good soil, containing broken soft, red brick, with a little Ichthemic guano. Watering is an important matter, and clematis planted in borders against dwelling-houses often become dry at their roots. They should be attended to regularly, and be sometimes fed with weak liquid manure.

#### VARIETIES.

*Jackmanni*, the purple variety is best known. It is one of the large-flowered varieties, producing single and double flowers of a variety of colours. *Montana* (American Virgin Bower), pure white, a valuable climber, suitable for all parts of the State.

The small-flowered species, such as *C. paniculata*, *C. Virginia*, &c., with small white flowers in dense clusters, and *C. reticulata*, *C. coccinea*, &c., with somewhat large though still small blossoms, thrive exceedingly well.

Madame André is a crimson variety. It is a constant and profuse bloomer, and has only one defect, and that is, its dwarfish growth. After three years it may only attain a height of a little over 4 ft. Instead of a few separate vines that grow several feet in a season, it forms rather a mass of short vines that expend all their strength in blooming. Its flowers are large, about 4 in. in diameter, but never attain the size of the full-grown *Jackmanni*. Occasionally there are situations where a dwarfish grower would be preferred, and there Madame André would give perfect satisfaction. A third variety is the white *Henryi*. It is as rapid a grower as the *Jackmanni*, and is also perfectly hardy so far as tried. It begins to bloom early, and its flowers are immense in size. They seem to continue to grow after they open, until they attain a diameter of full 6 in.

They are a fine, creamy white. *Henryi* appears to be fully equal to *Jackmanni* in every desirable quality, and may surpass it in vigour and growth.

---

#### CEMENT FROM SOAP WASTE.

The "Indian Trade Journal" says:—It may be of interest to soap manufacturers to know that a striking instance of the important bearing of applied science to industry has recently been furnished at the factory of one of the largest Canadian soap manufacturers. In preparing soap an immense quantity of various residues accumulates. Some of these can be turned to commercial advantage, such as glycerine, but others have hitherto resisted any profitable application. Among the latter is carbonate of lime, which is produced in large quantities. In the course of prolonged experiments in the chemical laboratory searching for some means of utilising this waste, the above manufacturers succeeded in discovering that it could be profitably employed in the making of Portland cement, and, the process being commercially applicable, a large factory as an adjunct to the soap refineries is being erected, capable of turning out over 400 tons of cement per week.



## Tropical Industries.

### SISAL HEMP IN GERMAN EAST AFRICA.

A good example of what may be achieved by energy and common sense, in establishing new industries in a colony, is afforded by the work done in German East Africa in the sisal industry. For years the rich returns to be derived from planting sisal have been reiterated to farmers and planters in Queensland, but with small result. Since Mr. P. McLean introduced some plants from the Bahamas some twelve years ago, the price of sisal fibre has ranged from £50 per ton in 1902 to £37 per ton in 1907. In 1908 there was a sudden fall in price to £30 in March and £25 in June, owing to manipulation of the Manila hemp market. (*See table in the Pamphlet on the Sisal Hemp Industry, issued by the Department of Agriculture and Stock.*) Since then the price has again risen, until, in December, 1908, we were advised that the value of fourcroya fibre (Mauritius hemp) in England was £30 per ton, and, as this fibre is usually from £3 to £4 less in value than sisal, it follows that the price of the latter has risen proportionately.

Dr. Maxwell, in his report on the Mackay Sugar Experiment Station, just issued, deplors the want of enterprise on the part of the farmers in the district, no application having been made by them for sisal suckers wherewith to start a paying business.

Turn we to the German colony, for a contrast.

Attention has been given to sisal hemp cultivation in German East Africa since 1893 (says the "Agricultural News" of Barbados), and the increasing value of the industry is evident from the fact that the exports of fibre during 1906 were valued at £66,900, as compared with £43,900 in 1905 and £28,300 in 1904.

The industry was started by the importation of a small number of plants from Florida fifteen years ago. Machinery for the extraction of the fibre was imported in 1899, and the first exports were made in 1900. In 1904 the number of plants dealt with was 1,300,000, which yielded 624 tons of fibre, this being equivalent to an average yield of 17 oz. of fibre per plant. In the following year the average return of fibre rose to 25 oz. per plant, but in 1906 it dropped to 22 oz. It is calculated that if 800 plants per acre are grown, an annual crop of 900 to 1,200 lb. per acre should be obtained.

The machine employed for the extraction of the fibre is the one used in Yucatan, and is known as the "Molla." It costs £650, is capable of dealing with about 100,000 leaves in ten hours, and requires 48-h.p. to drive it. In order to keep this machine sufficiently employed, a plantation of at least 600,000 plants is necessary. This (allowing distances of  $3\frac{1}{2}$  x  $8\frac{1}{2}$  ft. between the plants) represents an area of about 310 acres.

---

### PICKING COTTON.

There is no difficulty in picking well-ripened cotton, but much judgment is required to pick properly and to the best advantage. Where pickers are engaged to pick at so much per cwt., it is manifestly to their advantage to pick rapidly, and in so doing not to be very particular as to selecting the best, ripest, and cleanest bolls. Unless the clean cotton is kept apart from that which is stained, additional expense and loss of time are incurred by the grower and the ginner, in sorting it on arrival at the ginnery. We write from experience on this matter, as it was no uncommon thing to pick out from

10 to 20 lb. weight of stained cotton when delivered at the gin house by the farmer, and this in addition to such added trifles as stones, gravel, horse shoes, and even old boots. It is a very simple matter to so arrange the picking-bag that it shall be provided with a separate pocket, into which the stained bolls may be placed, the clean cotton going into a larger receptacle. The usual custom, in the old days of cotton-growing in Queensland, was to bag the cotton after only a few hours' exposure to the sun, and to cart it in at once to the ginnery, causing great loss to the buyer. Cotton should, after being dried, be kept in store for three or four weeks before being ginned, and turned over several times until the seed is so dry that it will crack between the teeth.

The "Cyprus Journal" has the following notes on picking:—

When the cotton-picking season begins, cotton-growers would do well to bear in mind the following hints:—

Do not leave the ripe cotton too long on the plants, but pick as soon as it is ripe.

Send all pickers, as far as possible, together to one field. In this way more careful supervision can be kept on the pickers and the cotton picked.

Stained and dirty cotton, when picked, should be put apart at once from the clean cotton. For this purpose a pocket on the picking-bag is very useful. It is easier to separate the stained cotton at the time of picking than afterwards.

Cotton, when cleaned and dried, should be kept in store from three to six weeks before being sent to the ginnery.

Cottons of different qualities should not be mixed.

---

### SUBSIDIARY CROPS FOR CANE FARMERS.

In cane-growing, as in the case of many other rural industries, there is a time when a lull occurs in the demand for labour, and more particularly is this the case for two or three months prior to the crushing season. The greatest demand for labour in the cane-fields occurs just after the mills have closed down, and the young cane has to battle with a strong growth of weeds, and after that the cutting of the crop calls for all available hands. It is natural that as the time approaches for the cane harvest, numbers of men from all parts of the State make for the sugar plantations, and many usually arrive several weeks before the mills are ready to work. During this time they are for the most part idle, and are put to expense for living instead of earning money. This state of affairs is, to a great extent, unavoidable, yet a remedy could be found, and the remedy lies in the cane-farmer growing subsidiary crops which would be ready for harvesting at any slack time. The most accommodating of such crops is sisal hemp. This plant will thrive well on the most worn-out sugar lands, on ridgy, rocky lands no longer utilised, or even utilisable, for cane-growing. If cane-growers would take a lesson from what has been done by a planter at Childers, there would be no need for men to idle away their time waiting to be first in the field for the cane harvest. A well-grown field of sisal, after its fourth, or, in favourable circumstances, its third year, would be ready to afford employment to men two or three months before cane-cutting commences. Should it even be mature six months previously, it will take no harm if allowed to stand over until the arrival of the cane harvesters, who would thus find profitable employment during a period of enforced idleness. Fifty acres of sisal plants would furnish employment for ten cutters for a month, and additional men would be needed for carting the leaves to the machine, for decorticating, baling, &c. All this



work could be done in the few weeks preceding the cane harvest. If 100 farmers were to each plant 10 acres of sisal, there would be, within four years, 1,000 acres, affording remunerative work to 200 or 300 men. Then, the cost of a central sisal factory, as compared with a central sugar mill, amounts to a mere trifle, from £1,000 to £1,500 being ample to establish the most up-to-date mill, which could be undertaken by the farmers as a co-operative concern. The gross returns of fibre from 1,000 acres should not be less than 500 tons, which would be worth, even at present prices, from £12,000 to £13,000, and in 1907-8 would have had a value of £18,000. The cost of production would probably amount to 50 per cent. of the market value of the fibre, giving a net profit of £6,000. Thus, from two points of view, the combination of sisal-growing with cane-growing would be distinctly advantageous. There would be no idle time for the men, whilst the farmers, in addition to the value of the cane crop, would realise from £6 to £8 per acre for the sisal from a first crop, considerably more from the next, and the sale of suckers, for which there is much demand, would materially reduce the cost of production.

#### OTHER CROPS.

In this number of the Journal we publish an article on the Kapok, or Cotton-tree. From what is there stated, it is evident that the cultivation of Kapok would be advantageous to the sugar-planter, and the harvesting of the crop would be an additional source of income to the workers, waiting for the cane harvest to begin. Here, again, the worn-out land and areas unsuitable for sugar-growing could be profitably utilised. The Kapok trees apparently thrive with little attention, and begin to bear two years after planting. There are large areas of land in most cane-growing districts which have been thrown out of cultivation, and which are in some cases overrun with lantana and other useless vegetation. With very little trouble such areas could be placed under kapok, and the gathering of the crop would always be assured, by means of the workers gravitating early towards the plantations.

Mr. A. Molineux, late of the Agricultural Bureau of South Australia, who is an acknowledged authority on all matters agricultural, contributed, in November last, to the "West Australian Journal of Agriculture," an excellent article on "Some Minor Products for Farmers," in which he said—

"With regard to many products which might be mentioned, it will be said that the labour bestowed on their production would not be repaid in the price realised for them. That is doubtless correct, if we had something better to do with our time, but it does not pay to do nothing, and the innumerable small rills of money rolling into the general income during a year will make quite a considerable amount when added up. . . . The value of a cow and a hen is scarcely worthy the attention of a man who expects to grow 3,000 bushels of wheat by the end of the season, and yet he finds that his wife makes more profit from a dozen cows and 50 hens during the year than he gets from his large fields of grain. Why is it thus? Simply because the hens keep laying, and the cows give their dole of milk every day for the greater part of the time, whilst he gets only the one crop for all his labour. Seeing then that these smaller items make profit, it is desirable that we should give them some thought."

What applies to the wheat-grower applies with equal force to the sugar-grower. Both have all their eggs in one basket. A rust year, a drought, severe frosts, such as were experienced in October, 1908, and the bottom of the basket drops out, with the result that the farmer loses, the wheat or cane harvester loses, and neither has anything to fall back upon. But, with one or two subsidiary crops, such as are unaffected by seasons, work is provided for many hands, and profit for the farmer, even although losses are sustained on the main crop. The intelligent farmer need never be idle. When the wheat



or the cane has arrived at a certain stage of growth, there is no more labour attached to either until harvest time. Why not devote the interval to raising some such crop as we have here indicated?

"We must try," says Mr. Molineux, "to divide our labour so that there shall be no dull round of similar occupation. It may even be a relaxation to 'knock off work and carry bricks.' We want one crop to follow another, and to learn how to harvest and even to manufacture some of those crops, so that the product shall bring approbation and honour as well as profit to us." Both these ends can be achieved by utilising the waste places of the farm for sisal, kapok, cotton, castor oil, and similar self-cultivating crops, for which a world's market exists. Then should we hear little of the common complaint of the unemployed, for there would be no "unemployed," although there might be inevitably be some "unemployable."

---

### KAPOK.

The following information concerning the "tree-cotton" known as kapok will doubtless prove of interest to farmers and others in tropical Queensland:—

The tree is propagated either from seed or cuttings taken from a mature tree. The trees may be planted on any well-drained land, on road-sides, in back yards, or on allotments where the land cannot be profitably used for other crops, or on large estates. The only cultivation required is the clearing away of brush or undergrowth. The trees grown from seed begin to bear pods in two years, and in three years should yield a fair crop. If grown from very large cuttings, pods will be produced in the first year, but with small, thin cuttings the time before bearing is the same as for seedling trees. The crop should be harvested in the dry season, when the pods are fully ripe, and the seeds can easily be separated from the lint. So far, the only means adopted for cleaning the lint are hand labour, but we believe there is a machine on the market adapted specially for this purpose.

On an average, a mature kapok tree should yield 200 pods a year, which will furnish  $2\frac{1}{2}$  lb. of lint and 4 lb. of seed. Trees should be planted 20 ft. apart, or 108 trees to the acre. The yield from these would be 270 lb. fibre and 432 lb. seed.

As to value, Mr. H. T. Edwards, Fibre Expert, Bureau of Agriculture in Manila, says: "Cleaned kapok of best quality was quoted in New York in March, 1907, at  $14\frac{1}{2}$  cents ( $7\frac{1}{4}$ d.) per lb. Ordinary kapok, not thoroughly cleaned, was quoted at  $12\frac{1}{2}$  cents ( $6\frac{1}{4}$ d.) per lb."

The planting of kapok trees requires but little capital and a very small amount of labour. They require practically no care, and flourish on the poorest soil, and there is a constantly-increasing demand for the fibre.

We find in an article on kapok in the "Indische Mercur," 1901, that small iron mills are used in Java for cleaning the kapok, each of which produces two piculs of fibre for a day's work. (The picul in Java is equal to 137 lb.) Four women are employed for each mill. In that publication, the yield per tree of fibre is given at from 2 lb.  $3\frac{1}{4}$  oz. to 111 lb., an adult tree giving 5,000 pods. In Java there are 50 plantations where kapok is produced as a subsidiary crop. On some, however, it is the principal crop. Some 38,000 bales are exported annually to Holland, Australia, China, and America, Australia taking over 8,000 bales. A bale of clean kapok weighs 37 kilos (about 80 lb.).

Here we have a product for which there is a large demand in Australia, which can be produced almost anywhere in North Queensland with little trouble and less expense.



## EXPERIMENTS WITH RUBBER SEEDS.

Experiments have been carried out by Mr. H. F. Macmillan, Curator, and Mr. T. Petch, Government Mycologist, Peradeniya, Ceylon, as to the weight and germinative capacity of *Hevea* rubber seed.

The seed was collected from (A) a group of trees about twenty years old, which had never been tapped, and from (B) a group of trees about thirty years old, which were tapped regularly in 1905 (29 lb. of dry rubber being taken from eight trees in three months), occasionally in 1906, but not at all in 1907. One thousand seeds were taken from each group, and each 1,000 were divided into ten lots of 100 each, which were weighed separately. One lot from each group was planted on 14th September, and the remaining lots were planted in pairs, after weighing at intervals of a week, until all were planted. It was found that the seeds lose weight rapidly during the first fortnight after collection, and then more gradually till about the sixth week, after which time their weight remains more or less constant unless they are transferred to a drier atmosphere. The loss in weight appears to be due almost entirely to loss of water.

One thousand fresh seeds from untapped trees weighed on an average 4,126.83 gr., or 9.1 lb., and this figure agrees with results obtained by Mr. Carruthers five years previously.

The loss in weight takes place almost entirely from the kernel.

The seeds from group B weighed, when fresh, on an average 3,540.8 gr., which is 7.8 lb., as the weight of 1,000 seeds from tapped trees.

It was from these trees that Mr. Carruthers obtained his seed in 1902; thus for

*Group B.*

1902 ... Untapped trees ... Weight of 1,000 seeds = 9.1 lb.

1905 ... Trees tapped.

1907 ... ... Weight of 1,000 seeds = 7.8 lb.

*Group A.*

1907 ... Untapped trees ... Weight of 1,000 seeds = 9.1 lb.

It is also stated by a planter that 1,000 seeds from his trees (fifteen years old) formerly weighed 10 lb., but now they average 7 lb., having diminished 1 lb. each year during tapping.

From the experiment it was clear that the seeds from tapped trees are smaller, weigh less per 1,000 seeds, are actually denser, but lose more weight in drying than those from untapped trees.

With regard to the germination tests, it was found that seeds from untapped trees were practically worthless if kept longer than two weeks, but that the seeds of tapped trees keep better, and both in percentage of germination and time of germination are better than seeds from untapped trees. These results, of course, apply only to germination, and as yet there is no indication as to the quality of the trees which would result from the two sets of seeds.

The full details of the experiments are given in Circular No. 11 of the Circulars and "Agricultural Journal" of the Royal Botanic Gardens, Ceylon, Vol. IV., for May, 1908. In the tables which are included for both groups the weights of the different lots of seeds and the percentage and time of germination are given. The circular concludes with a reference to the estimates of the return to be obtained by extracting oil from *Hevea* seed. Calculations have been made on the assumption that 1,000 seeds weighed 11 lb. (Wright), and 9.1 lb. (Carruthers), whereas from tapped trees, 8 lb. appears to be the more correct estimate for the weight of 1,000 seeds.

When dry and shipped to England, the kernels constitute about 50 per cent. by weight of the whole seed, and yield 42·3 per cent. of oil.

From these figures 280,000 fresh seeds or 350,000 dry seeds (yielding 700,000 kernels) = 1 ton.

The value of the kernels may be about £10 per ton.—“Bulletin of Miscellaneous Information,” Kew Gardens.

---

### THE PESSOU CANE HARVESTER.

At a meeting, held in May last year, of the Louisiana Sugar Planters' Association, the merits of a new cane-cutting machine, known as the Pessou Cane Harvester, came up for discussion.

During the last reaping season, it is stated, this harvester underwent several practical estate trials, with satisfactory results. The cane reaped by the machine in the chief of these trials was the Demerara seedling D. 74, of which 4 acres were cut, and laid out in rows, in  $4\frac{1}{2}$  hours. Four mules were used to draw the machine, and three men were employed in the work. This represents a reaping power of from 120 to 200 tons of cane per day of 10 hours.

The machine is built entirely of iron and steel. It is mounted on four wheels, two of which run on either side of the row of canes to be cut. The revolving knives may be raised or lowered to any level required, and one of the chief advantages urged in favour of the harvester is that by its means the canes may be cut much lower than by hand labour. This, of course, results in a superior return being obtained. It is claimed that the experiments so far carried out have demonstrated that the weight of cane cut per acre by the machine is 2 tons greater than that reaped by hand labour, while the yield of sucrose obtained represents a gain of 453 lb. per acre, as compared with the return given under ordinary cane-cutting methods. This is equivalent to an additional 5 per cent. in the average crop yield. Figures relating to estate work done last season by the harvester are given in support of the above claim.

It was remarked, in relation to the experiments carried out, that the use of the machine had no bad effect on the stools of cane, and the resulting ratoons show no signs of damage whatever. Alternate rows were cut by the machine and hand labour respectively, and there is little difference to be observed in the condition of the ratoon crop following, and now under cultivation.

One of the speakers who had had experience with the Pessou harvester expressed his conviction that the machine was of practical design and construction, and that in the hands of an intelligent man it could be worked with great benefit and saving to planters.

Probably the harvester will require certain modifications before it is thoroughly adapted to practical estate use, but if developed, and put on the market at a reasonable price, such a machine would, of course, result in an enormous saving of labour on large estates. This should especially recommend it to the consideration of planters in British Guiana.—“Agricultural News,” Barbados.

---

### CUT WORMS.

A good bait for these pests is composed of 1 lb. of arsenite of soda, 8 lb. molasses or brown sugar, and 10 gallons of water, the two first ingredients to be dissolved in water. Then cut up a quantity of lucerne or other green stuff into very small bits, and moisten them with the poisoned sweet. The lucerne must not be made too wet or it will not scatter. Distribute it a few days after the land has been ploughed, when no other green food will be available for the worms. They will devour it greedily, owing to their fondness for sweets.



## Vegetable Pathology.

### NEMATODE ROOT GALL.\*

By H. TRYON, Entomologist and Vegetable Pathologist.

The roots of the plant submitted, and, indeed, the entire portion of the axial growth whence they spring, are occupied by nodular growths, disconnected in some instances, but for the most part united in tuberous masses.

These might suggest the action of some destructive insect similar to the Root Louse (*Phylloxera vastatrix*) of the vine. We have, however, in them not the work of an insect, but the outcome of the attacks of Eel Worm (*Heterodera radicola*). However, *Phylloxera* and Eel Worm produce effects on the plant-economy very similar and equally baneful for it.

It will readily appear that whenever, in the plant, roots so affected take the place of ordinary sound ones, absorption on their part of moisture and nutrients is seriously interfered with, with the result that its growth is brought to an end sooner than it would otherwise happen; and should drought supervene its powers of resisting it will be seriously impaired. At the same time, the plant-constitution being weakened, there is greater likelihood of attack on the part of fungus-parasites than would otherwise happen.

#### CAUSE AND MODE OF OPERATION OF CAUSAL AGENT.

To briefly enter upon an account of the agent by which this root disease is caused, and its mode of operation, it may be stated as follows:—These root-tubercles owe their origin to the presence of a minute worm, and to the manifestation of its habits. This worm is of very small dimensions, and may occur in immense numbers in the soil. Ordinarily it cannot be discerned; but, should it have been placed in a few drops of clear water, it can not only be seen, but found to resemble generally in appearance a diminutive Thread Worm (the human parasite). This worm, spoken of as a "Nematode" (Gr., like a thread), possesses two successive phases in its life history. In one phase it lives exclusively within the soil, whereas in the second one its life is passed within the tissue of roots. There are both male and female Nematodes, and multiplication is effected through the production of numerous eggs. These eggs are given birth to whilst their parent is still confined within the roots of the plant affected; but either they, or the young worms that they give rise to, soon find their way into the soil in which these occur. A generation of the worms usually lives for about a month, and, ordinarily, almost the whole of this period is devoted to its internal occurrence within the roots of its host; but, under special circumstances, the life without the egg, or as a free existing animal, may be greatly prolonged.

Allusion is here made to the fact that both the Nematode and its eggs are highly resistant to the action of dryness, and, in fact, can be practically desiccated without their life being determined.

When the time and opportunity occur for the worm to establish parasitic relations with its host-plant, it brings itself in contact with its finer roots. Then it attacks these with a short but sharp dart-like organ, capable of being

---

\* The disease Nematode Root Gall is one that victimises a large number of plants, entering into field, orchard, or garden cultivation (*e.g.*, sugar-cane, banana, tobacco, coffee, grape-vine, paw-paw, stone and pip fruit trees, tomato, potato and other vegetables, cowpea and other pulses—accompanying nitrogen-fixing bacterial tubercles, several ornamental plants, Lantana, Sida, and various other weeds). It has for its main symptom the manifestation of numerous irregular tuberous swellings that may be found occupying every part of the root-system: and for its effect—the gradual destruction or shortened longevity of its host with an impairment of every process connected with growth and crop-production—this effect being precipitated with the occurrence of dry conditions. Commerce in plants (potatoes especially) and ignorance of both the nature and significance of this serious plant-malady are resulting in its wide dissemination, and it therefore seems expedient—anticipating fuller treatment of the subject—to give publicity to this memorandum originally prepared for the information and guidance of the Instructor in Tobacco Culture verbal amendments only been made herein.



withdrawn and exerted in turn, that is placed at its head extremity, and that is worked after the manner of a rock drill. By this means it is enabled to insinuate itself gradually into the interior of the rootlet assailed. Thereupon two things happen: (1) the plant, in response to the irritation due to its presence, produces new tissues, and thus a "gall" or "tubercle" is produced, with the result that functional energies that should be displayed in another direction are diverted to the formation of these bodies; and so not only may growth in this way be affected, but the character of the root as an absorbent organ may be largely obliterated. In the second place (2) the worm itself, or at least the female individual, undergoes wonderful transformations, until at length it becomes a flask-shaped organism, visible to the naked eye, and that may be described as a bag filled with oval eggs. Whilst gradually undergoing these changes it may, but not necessarily, move towards the outer surface of the gall; but whether or not it does this, ultimately it comes to a standstill, encysting itself in a small cavity formed in its tissue. Numbers of worms undergoing these transformations may be met within a single root-tubercle. Eventually some of the cysts or cavities become continuous with the exterior, and then two things happen: first, the worms, recently hatched, or indeed the eggs even, find their way into the surrounding soil; and, second, moisture being thus admitted to the root-gall's interior this gradually decays, and so the exit of the parasites therefrom is still further facilitated. Meanwhile, of course, the plant suffers from the deprivation of its roots; but, should soil conditions admit of it, it will continue to produce fresh roots to replace those of whose use it has been deprived, that, however, will eventually be assailed by the fresh generations of Nematodes that their predecessors have meanwhile furnished.

#### HOW DISSEMINATED.

Now, this serious root-destroyer does not confine its attacks to any one plant; but, on the other hand, will assail, with results equally prejudicial, almost all those constituting our cultivated crops, and, in fact, both perennial and woody plants, as well as annuals. Generally galls in the roots indicate their infestation by it; but, in some instances, only pimples betray this event.

This is a most important consideration, since it explains how the Nematode may be introduced into cultivations previously free from its presence. Thus, to effect this, a farmer has only to bring a few "pimply potatoes" to his holding, use these for culinary purposes, cast the skins on to the rubbish heap, and then distribute the resulting compost on to his land. Not only, therefore, should all plants having tubercles on their roots—in however slight degree—be excluded, but even the vegetables alluded to, affected in the manner described. Leguminous plants might have been excepted from this precaution were it not for the fact that these may be subject to the presence of these symptoms of disease, as well as to those normally occurring tubercles caused by nitrogen-furnishing organisms.

Similarly, no soil accompanying plants should be introduced from outside on to a farm, unless previously it has been disinfected by fire.

On the farm itself the disease, once present in one spot or so only, may soon be disseminated generally unless suitable precautions are taken. If disease-affected plants are ploughed in they will originate fresh centres of infestation; if horse implements are worked from Nematode-infested soil towards soil not in this condition, the parasite may be transported to the latter by their instrumentality, or even so by the soil which the horse's foot itself may convey; and, indeed, the parasite may pass spontaneously adown slopes borne along by water traversing them, as after rainfall. Commonly the disease is brought on to land from the seed bed. A sample of "nice soil" harbouring the parasite may unconsciously be selected for this purpose, with the result that almost every plant raised therein will be already infected at the time that it is set in its permanent station. This the writer has found actually to happen in two instances.



## MEASURES TO BE ADOPTED IN VIEW OF ACTUAL OCCURRENCE.

If the disease be of very local occurrence or quite confined to plants originally attacked, as under the last-mentioned circumstances, and its exact limits of existence be ascertainable by the condition that these display, these should be very carefully lifted, with the object in view of removing every tubercle-affected root or rootlet from the soil, and then burnt; the site of the plant then being dosed with quicklime or watered with strong limewater.

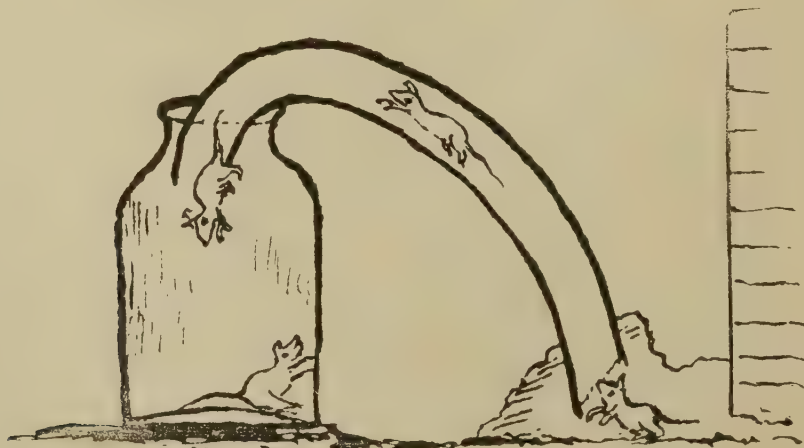
If the disease be general on the land, and the susceptible crop to which this is devoted be an annual one, it were better "in the long run" to abandon the soil to some other purposes than that of raising this crop, and utilise another site. Meanwhile measures of quarantine should be prosecuted with respect to it, and thus preferably it should be devoted to permanent pasturage. (In this connection it should be mentioned that many weeds—*e.g.* *Lantana*, *Sida retusa*, "Fat Hen" (*Chenopodium*)—are equally subject to the pest with ones the object of cultivation.)

Should this not be practicable, and the area infested be limited and of especial value, the following procedure, adopted on the European continent in connection with sugar-beet culture, might be found serviceable. It is dependent on the fact that these Nematodes at one period of their existence—unlike the common free-soil-frequenting Nematodes, of which there are many kinds—must enter the tissue of a growing plant. Thus the ground is sown with plants susceptible to attack, and when these have been growing for a period less than that necessary for a second generation to arise, they are rooted up and dealt with in a way that effect the destruction of the worms that have established parasitic connection with them. This action is repeated two or three times. Of course the ground meanwhile has been kept free from weeds that might also serve to perpetuate the Nematodes. In Germany beets are used for this *trap crop*, and they are suitable, as easily removed intact.

Finally, were it possible to treat successfully worm-infested soil in the field so as to rid it of these Nematode worms or their eggs, it would fully serve all that was desired in this direction. Hitherto no suitable substance capable of economical and effectual application has been known. Recently, however, an insecticidal manure named "Vaporite" has been placed on the market by an English firm—Messrs. Strawson and Sons—regarding which it has been claimed that it possesses these desiderata. This is stocked by Messrs. Webster and Co., of Brisbane.

## A NOVEL MOUSE TRAP.

A piece of an old bicycle tire and glass fruit jar are the only materials required for making this trap. Push one end of the tire in the hole, being



sure that there is a space left at the end so that the mice can get in. Then bend the other end down into a fruit jar or other glass jar. Bait may be placed in the jar if desired, although this is not necessary.—"Popular Mechanics."

## Animal Pathology.

### ACUTE TYMPANITES (HOVEN, OR BLOWN).

By SYDNEY DODD, F.R.C.V.S., Principal Veterinary Surgeon and Bacteriologist.

This is a condition occurring in ruminating animals, especially cattle and sheep, owing to the formation of gas in the rumen or paunch, and shown by a swelling in the upper part of the left flank. Hoven may be caused by any kind of food which gives rise to indigestion and fermentation. It is common in animals that have been turned into green feed early in spring, or that have broken into a field of green corn, &c. Grass or other green feed, when wet by dew or a slight shower, often disorders digestion and so induces tympanites. Also, when an animal eats its food too hastily or in too large a quantity, the action of the paunch is interfered with, the food ferments, and a large quantity of gas is formed which the animal is unable to get rid of by the ordinary method of eructation or belching, or passing the gas up from the stomach; this gas continues to form, and tympanites ensues; the animal becomes "blown." A number of other causes operate to produce hoven, but in this State the above are the chief.

The same condition may be seen when a cow is choked, as the obstruction in the gullet prevents the gas passing up from the paunch, where it accumulates. The swelling in the left flank is usually very characteristic, and, in bad cases, it can be easily observed between the point of the haunch and the last rib. If tapped by the fingers the swelling often sounds drum like, it is also very tense. The animal becomes very uneasy, and wears an anxious expression; breathing is quick, short, and difficult. If relief is not given to the animal, death may result from suffocation or rupture of the stomach or the diaphragm.

*Treatment.*—In slight cases driving the animal about for fifteen or thirty minutes will often give relief, or several buckets of cold water dashed against the cow's sides sometimes produce the same effect.

A very simple method is to place a thick stick or broom handle, or a piece of rope, or even straw band, smeared with grease or some other unsavoury material, in the mouth like a bit, and fasten it by tying behind the horns. The efforts of the animal to get rid of this causes a flow of saliva and swallowing movements, thus opening the gullet and allowing the accumulated gases to escape.

In very urgent cases it is necessary to allow the gas to escape without delay, and the best instrument to use is the trocar and canula, similar in shape but a little larger in bore than those for bleeding for inoculation purposes. The part selected for the puncture is a spot situated midway between the posterior edge of the last rib, the point of the haunch, and the bony processes projecting from the side of the backbone between these two points. If the trocar is sharp and the skin thin, the paunch may be punctured without any preparation; but, if the skin is very thick, it may be necessary to first make a cut through the latter, about half an inch long, with a sharp knife, and then thrust the trocar and canula into the paunch, the direction being from above, downward, inward, and slightly forward. The trocar or pointed part is withdrawn, and the tube or canula left in the flank. If the right part is struck—and this is not very difficult to arrive at—gas will rush out of the canula as soon as the trocar is withdrawn. If gas still continues to form, it may be necessary to leave the canula in position for some hours, or to insert it



again. As soon as one is satisfied that gas has ceased to escape, the canula should be removed. The trocar and canula should not be used except in cases of urgency.

If the animal is not too greatly distressed, and the "blown" condition not too pronounced, or after the greater part of the gas has been removed by the canula in bad cases, it is well to give the animal a drench (by the mouth) in order to prevent any more fermentation going on, and consequently prevent the formation of gas. Probably the best one to give in these circumstances is 1 oz. of carbonate of ammonia or 4 tablespoonfuls of aromatic spirits of ammonia dissolved in 1 quart of water. This not only prevents gas formation, but acts as a stimulant as well. Another good remedy is—liquid ammonia, 2 tablespoonfuls; oil of turpentine, 8 tablespoonfuls; linseed oil, 1 quart. Mix and give as one drench at once. When all danger is over, a laxative should be given. For this 1 lb. of Epsom salts in 1 quart of warm water may be used.

In connection with this subject it should be remembered that all the members of the sorghum family (including sorghum, millet, Kafir corn, &c.) contain, in the early stage of their growth, a substance known chemically as a glucoside. This, when it is acted upon by the stomach juices, becomes converted into prussic acid; and a number of cases, recently reported to me as having died from hoven while feeding on young sorghums, have undoubtedly died from sorghum poisoning.

*Treatment in Sorghum Poisoning.*—In these cases the ammonia drench should be given at once, or the animal may be made to smell the fumes of liquid ammonia for a second or so. Cold water thrown over the animal is of great assistance. As a rule, however, death occurs so rapidly that antidotes cannot be given soon enough.

Prevention is far more satisfactory than cure in sorghum poisoning, and should be carried out as follows:—

No stock should be allowed to graze on growing crops of sorghum, millet, Kafir corn, or other plant of the sorghum family. It should not be fed when green, but allowed to dry or "wilt" for a day or two. The poisonous principle disappears on drying, also when the plant reaches maturity. It is, therefore, safe, although not economical, to feed stock on green crops after they have blossomed and are forming grain.

---

### GARLIC FOR TICK FEVER.

Mr. John Buckley, of Vrede, Orange River Colony, South Africa, writing to the "Pastoralists' Review" (15th December, 1908) says that he received a letter from his son, who is farming in the Transvaal, in which he mentions the disease called "Rhodesian Redwater." The tick fever, he says, is not the ordinary redwater. For this, the cattle are inoculated with garlic by cutting an incision in the dewlap and putting a piece of garlic bulb in. A better method, he suggests, would be to obtain extract of the garlic and inject it. Garlic is an old remedy used by the Dutch for horses when they became badly infested with ticks. His cattle are all free from ticks, as, whenever ticks make their appearance on an animal, it is at once inoculated. Garlic, he continues, is a splendid condition remedy, as well as taking all the ticks off a beast in a couple of days, according to the quantity injected. He mentions the only beast in his herd with ticks. This is an old cow, which was so badly infested that a pin's head could scarcely be placed between the insects. The garlic remedy was tried two months after the cow had calved. Only a small bit was used, yet on the second day the ticks began to fall off, and on the seventh day the cow was perfectly clean, not even a brown one, such as is usually found under the tails of horses, being left. The remedy is stated to be effectual for a whole year with one inoculation.

## General Notes.

### MARVELS IN CULTIVATION.

A hot controversy has been roused in the inland districts by the results of various methods of cultivation, says a contributor to the "Australasian." Certain instances are freely quoted in which the crop from the most ordinary system was at least equal to the returns from more thorough and more costly ways of treating the soil. In one case a farmer declared that he had ploughed 50 acres three times, 50 acres twice, and 50 acres once for wheat, before sowing, and he declared that the yield from the land ploughed once was equal to that from the other two places. Inquiry elicited the fact that part of this land had previously been cropped more times than the other part, but it was impossible to discover which area had the advantage. Again, I learned that all the ploughings had been carried out between the beginning of February and seed time, and, of course, if the land were in a fairly friable condition, nothing could be gained by turning it over in the dry summer weather more than once. Had one piece been ploughed in one of the soft months of the year, and again prior to seeding, it is odds on that the farmer would have a very profitable return for his extra cultivation. Other instances which are quoted, apparently with the overt intention of proving that it pays best to simply irritate the surface of the soil, are mostly unreliable when investigated. Something quite new, however, has completely superseded all other instances of what may be expected from extra cultivation. Mr. Peacock, the manager of the Bathurst Experimental Farm, claims that he is raising crops under a system which will completely revolutionise farm practice. The secret of this marvel has not yet been given to the world by its discoverer, but he has said sufficient to rouse several farmers to rather violent criticism. It is reported that one farmer has offered to stake a sum of £500 against an equal amount put up by Mr. Peacock, the farmer backing himself to produce better returns from 100 acres cultivated for wheat and oats for two seasons than can be shown by Mr. Peacock. This idea seems to open up rather a wide range for a new form of gambling, and the Government may yet have to add clauses to the Betting Act which would prevent farmers from backing their crops to go stated yields per acre. Meanwhile, sensational reports are being published setting forth the yields obtained under Mr. Peacock's system. One states that 37 bushels of wheat and 40 bushels of oats have been obtained where the charm has worked, as against 4 bushels from land cultivated in the ordinary way, the season being a very bad one in the Bathurst district. Some of Mr. Peacock's fellow-officers are just a little inclined to ridicule the tremendous secret process which has yet to be given to the world. One stated that the main feature of the new scheme is simply leaving unbroken clods on the surface, but whether the large pieces are intended to throw a shade over the young plants, or to simply encourage them to grow higher than the object nearest to them, is not stated. The inventor is meeting all his opponents, and all the ridicule which is being heaved at him, with assertions that he has discovered a kind of elixir of plant life, and it will be at least interesting to hear his description of his methods when the oracle speaks.

### CURE FOR TICK POISON.

Many a valuable dog has been lost to its owner in consequence of scrub ticks. These venomous insects frequently fasten on dogs when the latter are hunting in the scrubs, and the owners, when they find their dogs sickening, rarely suspect that the ticks are at work on the animal, which is almost sure to die unless a speedy cure is resorted to.



The best treatment is usually said to be the injection under the skin of a solution of quinine. For a dog the solution should be equal to 1 to 4 gr. of quinine, and for a calf 5 to 10 gr.; and, if necessary, the injection to be repeated in twelve hours. A North Sydney resident supplies the following to the New South Wales "Farmer and Settler":—

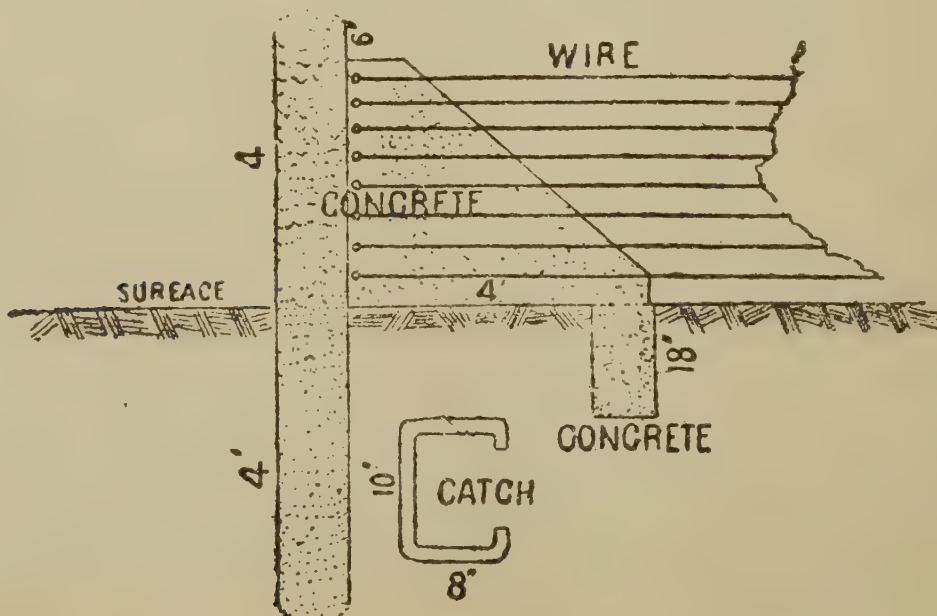
The flat brown tick with dark stripe down the back is the most poisonous among the various kinds, and is mostly found in the tea-tree scrub. The dog suffering from tick poison first shows a weakness in the loins, and soon after loses all power in the hindquarters. As far back as 1855 Mr. Charles Smith, of Manly, brought from England a pair of harriers specially for a present to a friend residing at Brisbane Water, which soon accumulated into a pack of thirteen. The scrub lands at this time were thick with padda-melon and smaller kinds of the wallaby tribe, and the dogs used to go hunting on their own, which resulted in the death at different times of the dogs from tick poison. But a Dr. Vaughan happened to be on the spot when one of the dogs most prized was affected, his hind parts being completely powerless. The doctor, after preliminary examination, concluded that the poison had caused a locking of the whole system, and that croton oil would be the remedy. Croton oil was administered, and a speedy recovery was the result. Henceforth the tick gave no concern; croton oil proved efficacious ever after. What was effectual then should be so now. In fact, Dr. Vaughan explained, any remedy that would have a speedy action upon the system of the dog affected would be a certain cure.

### REINFORCED CONCRETE.

The advantages of reinforced concrete as a material for various kinds of buildings, and for the construction of indestructible silos, have of late become so apparent that it is now used for many purposes for which timber has hitherto been employed. From the "Breeder's Gazette" we learn that farmers in America are discarding timber for straining posts of fences in favour of reinforced concrete.

The following method of constructing such straining posts is given by a farmer to the above publication:—

"The post form is made in two sections of No. 18 galvanised iron, and, when joined, form a cylinder. A cleat on one edge of each section holds them in place, and three iron rings of  $\frac{1}{4}$ -in. by 1-in. tire iron hold the sections together. The top ring is solid; the other two are hinged, and fasten with a wedge-shaped pin. In one edge of one section, at the proper place, I have two holes for hinge pins, and also two  $\frac{1}{2}$ -in. holes, 10 in. apart, for an iron staple as a catch for the gate latch.



"I dig my holes 4 ft. deep, about 12 in. in diameter, and use old iron rods or other metal for reinforcement. I fill the hole with concrete, then place the form on, and continue putting in hinge pins or gate catches.

"I use a barrel of cement to a yard of gravel, and what sand the gravel needs. I work down the side of the form with a thin light tamp. I take the form off the next day carefully, and paint at once with pure cement mixed with water to the consistency of thick paint.

"My brace, or stay form, is made of two sections, as shown, held apart by a 2-in. by 6-in. and together by four bolts. Two eye-bolts ( $\frac{5}{8}$ -in.) against post, and six pins,  $\frac{1}{2}$ -in., with eye at one end, form holes for bringing wire through, and after stretching one simple twist over the wire will hold tight.

"I have a piece of iron, 5 in. long, welded across the end of the hinge screw hook, and have my catches made in the form of an E with the centre stem left out."

### RAT POISONS.

Any effective means of destroying the rats which are so destructive in our cane fields will be welcomed, and not only by cane-growers, but by townspeople all over the State. Amongst the poisons recommended by the "Hawaiian Forester" are the following:—

*Barium Carbonate*.—One of the cheapest and most effective poisons for rats and mice, without taste or smell, and in the small quantities used in poisoning rats and mice is harmless to larger animals. Its action is slow but sure, and has the further advantage that the animal, before dying, if exit be possible, usually leaves the premises in search of water.

The poison may be spread on bread and butter, or more conveniently in ordinary oatmeal made into a stiff dough with one-eighth of its bulk of barytes.

#### *Other Poisons.*

1. Arsenic,  $2\frac{1}{2}$  lb.; cooked rice, 6 lb.; powdered glass, 2 lb.; toasted cocoanut, 2 lb.

2. Arsenic,  $2\frac{1}{2}$  lb.; cooked rice, 6 lb.; brown sugar, 2 lb.; powdered glass, 2 lb.; toasted cocoanut, 2 lb.

When these baits were tried in a rice field, the rats entirely disappeared after six days of continuous application.

3. Ratin.—The Ratin Laboratory, Gracechurch street, London, England, has put on the market a remedy, which, whilst being deadly to rats and mice, is quite harmless to all domestic animals. The success Ratin has met with is remarkable. Recently all the rats on the island of Little Cumbrae were absolutely eradicated, the island being formerly simply overrun by vermin. Equally good results have been noted in Grenada, Java, India, &c.

There are two kinds, the Ratin No. 1, which sets up a highly contagious disease, and which should, therefore, be used over large areas, and the No. 2, which is quicker acting, and which should be used where the vermin is congregated together, or after the use of the No. 1, where perhaps a few rats remain.

The poison is sold in tins of 6 oz., price 3s.; 2 lb.  $3\frac{1}{5}$  oz., 12s. 6d. The 6-oz. tin of No. 2 Ratin costs 3s. 6d., and the larger tin 15s. For mice, Ratin is sold in bottles containing  $2\frac{3}{5}$  oz., price 2s. 6d.

### SWEET POTATO WEEVIL.

The best methods for dealing with the sweet potato weevil ("Scarabee" or "Jacobs") from attacks which have been unusually prevalent at Barbados this year—a fact generally attributed to the dryness of the season—formed the subject of a paper read before a recent meeting of the Agricultural Society of the island by Mr. H. A. Ballou, M.Sc., Entomologist to the Imperial Department of Agriculture.



It was pointed out that one of the first points to receive attention, when a crop was attacked, should be the destruction of all infected potatoes, either by burning, boiling, or burying with lime. In clearing a field of a sweet potato crop, it is important (whether the plants are infested or not) to clean up all pieces of vines and roots, so that no food supply whatever is left for the weevils. If pieces of potato are put down in heaps at frequent intervals, these serve to attract the pests, which may be collected and destroyed—by dropping into a can containing water and kerosene. Small heaps of trash lying about also serve as hiding places for the weevils, and if these are burnt up after a while, numbers of weevils would almost certainly be destroyed. If it were practicable, it would probably be effective to trash any badly infected field, and burn it over.

Another point which should receive attention is the establishment of a suitable rotation of crops on land known to have been infested with the weevil. It would naturally be most unwise to grow sweet potatoes twice in succession on the same land. It is important, too, that the crop should be gathered immediately it is ripe.—“Agricultural News,” Barbados.

HOT BEARING.

It is said that if a bearing begins to run hot it may be cooled—in many cases without stopping the engine—by oiling with good castor oil.

Times of Sunrise and Sunset at Brisbane, 1909.

DATE.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.42	5.40	6.20	5.57	5.46	7 Jan. ○ Full Moon 0 13 a.m.
2	4.57	6.46	5.22	6.41	5.41	6.19	5.58	5.45	
3	4.58	6.46	5.22	6.41	5.42	6.18	5.58	5.44	15 „ ☾ Last Quarter 4 11 „
4	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.43	22 „ ● New Moon 10 12 „
5	4.59	6.46	5.24	6.40	5.43	6.16	5.59	5.42	29 „ ☾ First Quarter 1 7 „
6	5.0	6.47	5.25	6.39	5.44	6.15	6.0	5.41	
7	5.1	6.47	5.25	6.38	5.44	6.14	6.0	5.40	
8	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	
9	5.2	6.47	5.27	6.37	5.45	6.12	6.1	5.38	5 Feb. ○ Full Moon 6 25 p.m.
10	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	13 „ ☾ Last Quarter 10 47 „
11	5.4	6.47	5.28	6.36	5.46	6.10	6.2	5.35	
12	5.5	6.47	5.29	6.35	5.47	6.9	6.3	5.34	20 „ ● New Moon 8 52 „
13	5.5	6.47	5.30	6.34	5.48	6.7	6.3	5.33	27 „ ☾ First Quarter 0 49 „
14	5.6	6.47	5.30	6.33	5.48	6.6	6.4	5.32	
15	5.7	6.47	5.31	6.33	5.49	6.5	6.4	5.31	
16	5.8	6.47	5.32	6.32	5.49	6.4	6.5	5.30	7 Mar. ○ Full Moon 0 56 p.m.
17	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.29	
18	5.9	6.47	5.33	6.30	5.50	6.2	6.6	5.29	15 „ ☾ Last Quarter 1 42 „
19	5.10	6.46	5.34	6.29	5.51	6.1	6.7	5.28	22 „ ● New Moon 6 11 a.m.
20	5.11	6.46	5.35	6.28	5.51	6.0	6.7	5.27	29 „ ☾ First Quarter 2 49 „
21	5.12	6.46	5.35	6.28	5.52	5.59	6.8	5.26	
22	5.12	6.46	5.36	6.27	5.52	5.57	6.8	5.25	
23	5.13	6.46	5.37	6.26	5.53	5.56	6.9	5.24	
24	5.14	6.45	5.37	6.25	5.53	5.55	6.9	5.23	6 Apr. ☾ Full Moon 6 28 a.m.
25	5.15	6.45	5.38	6.24	5.54	5.54	6.10	5.22	14 „ ☾ Last Quarter 0 30 „
26	5.16	6.45	5.38	6.23	5.54	5.53	6.10	5.21	
27	5.17	6.44	5.39	6.22	5.55	5.52	6.11	5.20	20 „ ● New Moon 2 51 p.m.
28	5.17	6.44	5.40	6.21	5.55	5.51	6.12	5.19	27 „ ☾ First Quarter 6 36 „
29	5.18	6.43	...	...	5.56	5.50	6.12	5.18	
30	5.19	6.43	...	...	5.56	5.48	6.13	5.17	
31	5.20	6.42	...	...	5.57	5.47	...	...	

## Answers to Correspondents.

### TO BORE A HOLE THROUGH GLASS.

"YOUNG MECHANIC," South Brisbane.—

Try this. We do not vouch for success, but it is said that a hole may be bored through window glass—not plate glass—by pressing a disc of wet clay—preferably putty—upon the glass. Then make a hole in the clay of the size required, down to the bare glass. Pour in molten lead, and the lead and glass will fall out at once, leaving a clean hole.

For plate glass you want a boring tool, supplied with water and emery powder.

### KAPOK.

KAPOK, Herberton.—

See article on Kapok in this issue.

### BORING INSECTS.

"SUBSCRIBER, Goomboorian.—

Boring insects are usually the larvæ of beetles of various kinds. Some of these beetles are leaf-eaters, and can be destroyed by spraying with Paris green; others, again, can be destroyed by placing a cloth under the trees and then shaking the beetles on to it, when they can be swept up and killed. When the insects are in the larval or borer stage, if they are of large size, they can often be killed by inserting a fine pliable wire into their burrows, or by injecting a small quantity of kerosene or turpentine into the latter, and plugging up the latter with a piece of soft wood or clay. In any case, when borers are at all troublesome, the mature insects (beetles) should be destroyed whenever and wherever they are found. Spraying with lime, sulphur, and salt wash is a good preventive, as it acts as a deterrent to the mature insects depositing their eggs (from which the borers are evolved) on the parts sprayed. But the latest remedy talked about is a beetle discovered in Saxony, Germany; and a gentleman has been deputed by a Ceylon society to bring from Saxony a colony of beetles, provided he is satisfied that their introduction, while proving actively inimical to the "borer," may not be the introduction of an independent beetle pest. The editor of the Ceylon "Tropical Agriculturist" thinks, however, that this will be rather a difficult matter to decide in Saxony.

### UNDERGROUND TANK.

D. M., Kenmore.—

Mr. A. Morry, Department of Agriculture, supplies the following information on the subject of underground tanks:—

Tank to contain 15,000 gallons will be 2,400 cu. ft., inside measurement; a convenient size would be 16 ft. inside diameter by 12 ft. in depth; this will require the removal of 108 yd. cubic of earth.

The best method of construction, if bricks and concrete materials are equally available, is the following:—

Excavate the ground to a depth of 13 ft. by 17 ft. 6 in. in diameter, keeping the sides perfectly plumb all round. Lay the floor with cement concrete 6 in. thick, in the proportion of 1 cask or 3 bags of cement to 1 yd. of clean river gravel, with a fair proportion of coarse sand; if clay is available, well pug the bottom with 3 in. of clay before laying down the concrete.



Set out the tank 16 ft. in diameter in the clear, and build up a wall all round with  $4\frac{1}{2}$ -in. brickwork set in cement compo, in the proportion of 1 of cement to 3 of sand; rake out the face joints of brickwork before the cement has set hard, so as to form a key for the coating; this will leave a space of  $4\frac{1}{2}$  in. all round at the back of brickwork if the excavation has been made correctly. When the brickwork has been carried up about 2 ft., fill in at the back of same with concrete as before described, and well ram the same in position, taking care, however, not to displace the brickwork; a good plan is to get as much brickwork as possible done during one day, allow it to set over night, then fill in the concrete behind same next morning, and proceed with the brickwork as before; the advantage of this plan is that no expensive or troublesome timbering is required, because, to build a circular tank of concrete only, circular timber ribs would be required, and a carpenter to fix the same each time of removal. This composite wall of brick and concrete would be 9 in. thick, and if the earth was of a clayey nature no cement facing would be required, provided that the concrete was put in soft and well rammed, but in the majority of cases it would be found necessary to cover the inside face of brickwork with a coating of cement  $\frac{1}{2}$ -in. thick, in the proportion of 1 of cement to 2 of sand; this should be finished off with the wood float, an operation which can be easily performed by anyone after a little practice. Any thickness of concrete required can be put in behind the brickwork, but it should be noted that a segmental template is required for setting out the brickwork, and that the bricks should always be well wetted before use—this is a most important precaution, and must not be overlooked.

The tank could be covered with timber if desired; a few good logs would be necessary to span 16 ft., then any kind of covering could be utilised; the best cover, however, for a permanent tank of this character is undoubtedly concrete reinforced with steel or iron, on the following plan:—Rough centering should be provided for carrying the concrete until set; bearers could stretch across at suitable intervals, a few bricks being left out of the walls for the purpose; on these bearers pine boards can be placed close together. Four old steel rails should then be procured from the Railway Department, and stretched across about 3 ft. 4 in. apart, and fixed close down on the centering; between the flanges of these rails, rods of 1-in. angle iron should be placed at right angles, about 2 ft. apart, leaving a manhole in the centre, then fill in the whole with 4 in. of concrete as before described; when set, the centering can be withdrawn, and the cover will be found complete, and will last practically for ever; the iron or steel reinforcement being embedded in the concrete will be effectually protected. No trees should grow within 20 ft., or the roots may cause damage; some trees should be kept even farther away. Most of the work can be done by ordinary farm labour; if a bricklayer was engaged he would be occupied about seven days, with the usual labourer's assistance; 3,500 bricks would be required, costing, in Brisbane, about 50s. per 1,000, without carting—400 equals a load; 16 yd. of gravel; 16 casks of cement for concrete, 4 casks for brickwork, 5 casks for cementing inside—total, 25 casks at 14s.; bricklayer's wages, £4 4s.; iron and timber, say £5; or a total cost for materials, except gravel, and labour, except ordinary farm labour, and carting, of £35.

The cost of galvanised iron tanks to store the same quantity would reach about £70.

### CHOPPED SUGAR-CANE AS FODDER.

J. PORTER, Cairns.—

Sugar-cane can be chaffed in an ordinary strong chaffcutter. The cane chaff, 25 lb. cane-top chaff, and 5 lb. of bran; or 18 lb. lucerne chaff, 25 lb. feeding value than maize ensilage. The bran cannot be replaced by sugar-cane chaff, and, if no bran can be obtained, a proportionately larger amount

of lucerne has to be fed to supply the necessary amount of nitrogen. If the whole cane is chaffed up, more will have to be used than of cane-top chaff.

A cow yielding about 10 quarts of milk requires a ration of 10 lb. lucerne chaff, 25 lb. cane-top chaff, and 5 lb. of bran; or 18 lb. lucerne chaff, 25 lb. cane-top chaff.

Molasses can be added to the chaff in small quantities, but cannot replace the chaff itself.

#### FAILURE OF POTATO CROP.

"POTATOES," Bell.—

July is too early to plant potatoes in any district except close to the seaboard or above the frost line. The cause of the potatoes not bottoming is often due to planting a late-maturing, unsuitable kind, and to the plants being subjected to excessive heat, such as you mention having experienced. The result is that the plants become drawn, and waste their energy in forming haulms instead of tubers.

You can plant potatoes in February if seasonable weather is experienced, but an early-maturing kind should be selected, such as Early Rose, Early Vermont, or Brownell's Beauty. The last-named will be found one of the best all-round sorts for your district.

---

#### THE PUMPKIN BEETLE.

At the request of the Entomologist, it is notified that the article which appears under his name on the subject of the Pumpkin Beetle in our issue of January last is disclaimed by him.

The author should have been stated to be the Assistant Entomologist.

---



## The Markets.

### PRICES OF FRUIT—TURBOT-STREET MARKETS.

Article.	DECEMBER.	
	Prices.	
Apples (Eating) per case ... ..	5s. to 6s.	
Apples (Cooking), per case ... ..	5s. 6d. to 6s. 6d.	
Apricots, per quarter-case ... ..	3s. 6d. to 4s. 6d.	
Bananas (Cavendish), per dozen ... ..	1½d.	
Bananas (sugar), per dozen ... ..	1d.	
Grapes, per lb. ... ..	1d. to 1½d.	
Lemons (Italian), per case ... ..	18s. to 20s.	
Lemons (Sydney), per case ... ..	10s. to 12s.	
Mangoes, per case ... ..	5s. to 7s.	
Nectarines, per case ... ..	3s. 6d. to 4s.	
Passion Fruit, per quarter-case ... ..	1s. 6d. to 2s.	
Papaw Apples, per quarter-case ... ..	2s.	
Peaches, per quarter-case ... ..	3s. to 5s.	
Pears, per quarter-case ... ..	6s. to 7s.	
Plums (best), per quarter-case ... ..	4s. to 5s.	
Pineapples, rough, per dozen ... ..	8d. to 1s.	
Pineapples, smooth, per dozen ... ..	1s. 6d. to 2s. 6d.	
Rock Melons, per dozen, according to size ... ..	2s. to 4s.	
Tomatoes, per quarter-case ... ..	1s. 6d. to 3s.	
Water Melons, per dozen, according to size ... ..	2s. to 8s.	
Tomatoes, per quarter-case ... ..	2s. to 4s.	

### SOUTHERN FRUIT MARKET.

Apples (Tasmanian) eating, per case ... ..	10s. to 12s.
Apples (Tasmanian) cooking, per case ... ..	9s.
Apples (Local), per case ... ..	12s.
Apricots, per quarter-case ... ..	5s.
Apricots (Tasmanian), per quarter-case ... ..	5s. 6d.
Bananas (Queensland), per bunch ... ..	1s. 6d. to 4s. 6d.
Bananas (Queensland), per case ... ..	8s. 6d. to 9s.
Cherries, per quarter-case ... ..	...
Grapes (Queensland), black, per 12-lb. box ... ..	5s.
Grapes (Queensland), white, per 12-lb. box ... ..	4s.
Lemons, per gin case ... ..	18s.
Mandarins, per case ... ..	10s.
Mangoes, per case ... ..	...
Nectarines, per half-case ... ..	5s.
Oranges (Local), per case ... ..	10s.
Oranges, Navel, per case ... ..	12s. to 14s.
Passion Fruit, choice, per quarter-case ... ..	4s. to 6s.
Pears, per case ... ..	5s.
Peaches, per case ... ..	7s.
Pineapples (Queensland), choice, Queen, per case ... ..	8s. to 9s.
Pineapples (Queensland), medium, per case ... ..	6s. 5d. to 7s. 6d.
Pineapples (Queensland), choice common, per case ... ..	5s. to 6s.
Pineapples (Queensland), Ripley Queen, per case ... ..	6s. to 8s.
Plums, per gin case ... ..	4s. to 5s.
Rock melons (Local), per case ... ..	6s. to 7s. 6d.
Water melons (Queensland), choice, per dozen ... ..	15s.
Water melons (Queensland), small to medium, per dozen ... ..	4s. to 8s.
Water melons (Local), medium, per dozen ... ..	4s. to 10s.
Tomatoes (best), per quarter-case ... ..	3s. 6d. to 4s.

# PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JANUARY.

Article.							JANUARY.	
							Prices.	
Bacon, Pineapple ...	...	...	...	...	...	lb.	9½d. to 11d.	
Barley, Malting ...	...	...	...	...	...	"	...	
Bran ...	...	...	...	...	...	ton	£5 10s. to £6 10s.	
Butter, Factory ...	...	...	...	...	...	lb.	10½d.	
Chaff, Mixed ...	...	...	...	...	...	ton	£5 10s.	
Chaff, Oaten ...	...	...	...	...	...	"	£4 10s. to £7	
Chaff, Lucerne ...	...	...	...	...	...	"	£4 10s. to £6 10s.	
Chaff, Wheaten ...	...	...	...	...	...	"	£4 10s. to £5 10s.	
Cheese ...	...	...	...	...	...	lb.	5½d. to 6d.	
Flour ...	...	...	...	...	...	ton	£9 15s. to £10	
Hay, Oaten ...	...	...	...	...	...	"	£7 to £7 10s.	
Hay, Lucerne ...	...	...	...	...	...	"	£3 15s. to £4 10s.	
Honey ...	...	...	...	...	...	lb.	2d. to 2½d	
Maize ...	...	...	...	...	...	bush.	4s. 4d. to 4s. 6d.	
Oats ...	...	...	...	...	...	"	3s. 9d. to 4s. 3d.	
Pollard ...	...	...	...	...	...	ton	£6 5s	
Potatoes ...	...	...	...	...	...	"	£5 to £10	
Potatoes, Sweet ...	...	...	...	...	...	"	...	
Pumpkins ...	...	...	...	...	...	"	...	
Wheat, Milling ...	...	...	...	...	...	bush.	3s. 10d. to 4s.	
Wheat, Chick ...	...	...	...	...	...	"	4s. 11d.	
Onions ..	...	...	...	...	...	ton	£6 to £7 5s.	
Hams ...	...	...	...	...	...	lb.	1s. 1d. to 1s. 1½d.	
Eggs ...	...	...	...	...	...	doz.	7½d. to 1s. 5d.	
Fowls ...	...	...	...	...	...	pair	4s. 4d. to 5s. 3d.	
Geese ...	...	...	...	...	...	"	7s. to 8s.	
Ducks, English ...	...	...	...	...	...	"	4s. 6d. to 5s. 4d.	
Ducks, Muscovy ...	...	...	...	...	...	"	5s. 6d. to 7s. 3d.	
Turkeys (Hens) ..	...	...	...	...	...	"	10s. to 12s.	
Turkeys (Gobblers)	...	...	...	...	...	"	21s. to 28s.	

## ENOGGERA SALEYARDS.

Animal.							DECEMBER.	
							Prices.	
Bullocks ...	...	...	...	...	...	...	£8 7s. 6d. to £10 2s. 6d.	
" (single) ...	...	...	...	...	...	...	£13 2s. 6d.	
Cows ...	...	...	...	...	...	...	£7 7s. 6d. to £8 17s. 6d.	
Merino Wethers ..	...	...	...	...	...	...	18s. 9d.	
C.B. "	...	...	...	...	...	...	20s. 3d.	
Merino Ewes ...	...	...	...	...	...	...	15s. 9d.	
C.B. "	...	...	...	...	...	...	18s. 3d.	
Shrop. "	...	...	...	...	...	...	16s. 9d.	
Lambs ...	...	...	...	...	...	...	11	
Lambs (Extra) ...	...	...	...	...	...	...	18s.	



## Farm and Garden Notes for March.

**FIELD.**—Take every opportunity of turning up the ground in readiness for sowing and planting winter crops. The main crop of potatoes should at once be planted. As the growth of weeds will now be slackening off, lucerne may be sown on deeply-cultivated soil. The latter should be rich and friable, with a porous sub-soil. The land should be thoroughly pulverised. Do not waste time and money in trying to grow lucerne on land with a stiff, clay sub-soil. Prepare the land a couple of months before sowing, care being taken to cross-plough and harrow before the weeds have gone to seed. This ensures a clean field. Sow either broadcast or in drills. In the former case, 20 lb. of seed will be required; in the latter, 10 lb. A good stand of lucerne has been obtained with less quantities. Lucerne seed is worth from £2 16s. to £3 5s. per cwt. Should weeds make their appearance before the plants have sent down their tap-roots, mow the field. Before they can again make headway enough to do any damage, the lucerne will be strong enough to hold its own against them. Harrow and roll the land after mowing. Gather all ripe corn. It is now too late to sow maize, even 90-day, with any certainty of harvesting a crop of grain. Rye grass, prairie grass, oats, barley (in some districts, wheat), sorghum, vetches, carrots, mangolds, and Swede turnips may be sown. In Northern Queensland, sow tobacco-seed, cow-pea, Carob beans, sweet potatoes, opium poppy, &c. Sow Anatto, Jack fruit, and plant Kola-nut cuttings. Some temperate zone vegetables may be planted—such as egg-plant, potatoes, &c. Coffee-planting may be continued. Harvest Kafir corn and paddy.

**FLOWER GARDEN.**—Now is the time to plant out bulbs. A complete garden could be furnished with these charming plants, which are to be had in every colour and variety. Amongst the many are—Amaryllis, anemone, arum, babiana, crinum, crocus, freesia, ranunculus, jonquils, iris, ixias, gladiolus, narcissus, Jacobean lilies, tigridia, tritonia.

All bulbs like well-drained, somewhat sandy soil, with a plentiful admixture of leaf mould. Herbaceous plants and annuals which it is intended to raise from seed should be sown this month. Such are—Antirrhinums (snap-dragon), asters, cornflowers, dianthus, larkspurs, daisies, cosmia, candytuft, lupins, gaillardias, godetia, mignonette, poppies, pansies, phlox, sweet peas. Cannas now planted will require plenty of food, in the shape of liquid manure. Put in cuttings of carnations. Chrysanthemums require attention in the way of disbudding, staking, watering with liquid manure, &c. Growers for exhibition will thin out to a few buds, and protect the flowers from rain and sun. Dahlias should be looking well. To secure fine blooms, disbudding should be done.

Now, as to climbers which may now be planted. These are—Allamanda Schottii (beautiful yellow), Antigonon leptotus, a charming cerise-coloured climber; Aristolochia elegans, handsome as an orchid, and easily grown; Aristolochia ornithocephala (Dutchman's Pipe), very curious, large, always attracts attention; Asparagus plumosa, grows in any shady place; Beaumontia grandiflora, splendid white flower, grand for a fence, will grow 50 ft. high; Bignonias of several kinds; Bougainvilleas, with their splendid leafy, pink and purple flowers, rapidly clothe a fence or unsightly shed with a blaze of blossom; Quisqualis indica, a fine creeper, flowers pink, changing to white; Wistaria, purple and white. Most beautiful is the Bauhinia scandens, rarely seen about Brisbane. We grew a plant of this climber at Nundah, and it soon closed in the front of the veranda for a distance of over 80 ft. The leaves are very small, and in the flowering season it presents almost a solid



mass of beautiful round bunches of blossom, something like the hawthorn bloom—pink and white. It seeds freely, but the seeds are difficult to germinate, and when they have produced a plant it is still more difficult to rear it. A rooted sucker from the main stem will, in all probability, grow.

KITCHEN GARDEN.—During this month a very large variety of vegetable seeds may be sown in readiness for planting out where necessary in the Autumn, which begins on the 20th March. All unoccupied land should be roughly dug, and, where required, add well-decomposed manure. Transplant cabbage, cauliflower, celery, &c. Sow French beans, beet, carrot, turnips, radish, cabbage, cauliflower, cress, peas, mustard, &c. Former sowings should be thinned out and kept clear of weeds. Mulch round melon and cucumber beds with a good dressing of long stable manure, as it assists in keeping the fruit clean and free from damp. Cucumbers, melons, French beans, and tomatoes should be looked for every day and gathered, whether required or not, for if left on the vines to perfect their seeds the plants will soon cease to be productive, or will form inferior, ill-shaped, and hence unsaleable fruit.

---

## Orchard Notes for March.

By ALBERT H. BENSON, M.R.A.C.

### THE SOUTHERN COAST DISTRICTS.

The marketing of the main crop of pineapples will continue to occupy the attention of growers; and as it is probable that the plantations have been allowed to get somewhat dirty during the previous month, they should be cleaned up as soon as ever the crop has been got off. The fruit of the new crop of citrus fruit will be showing signs of ripening towards the end of the month; and as the fruit during this period of its growth is very liable to the attack of insect pests of various kinds, it is important that steps be taken to prevent loss arising from this cause as far as possible.

Large sucking moths of several kinds attack the fruit as soon as it shows signs of ripening; and as they always select the first fruit that shows signs of colouring, it is a good plan to gather a few forward fruit and to ripen them up quickly by placing them on a barn floor, and covering them up with bags or straw. They will turn colour in a few days, and develop the characteristic scent of the ripening fruit. The fruit so treated should be hung up in conspicuous places in the orchard as trap-fruit, as not only will it attract the moths, but also the fruit flies. The moths will be found clustered round the trap fruits in large numbers, and can then be easily caught and destroyed. Fruit fly will also puncture such fruit; and if the fruit is destroyed before the larvæ reach maturity, a later crop of these insects is prevented from hatching out. Fruit flies may also be caught in large numbers by means of such artificially-ripened fruits. The fruits are smeared with tangle-foot, and hung about the orchard. The fly, attracted by the colour, settles on the fruit, and is caught in a similar manner to house flies on specially-prepared sticky paper. These simple remedies, if carefully carried out, will result in the destruction of large numbers of sucking moths and fruit flies.

The yellow peach moth that does such damage to peaches in Spring, and that attacks corn, sorghum, cotton bolls, custard apples, and many other plants and fruits, often does a lot of damage to citrus fruits. It acts in a very similar manner to the second and later generations of the Codling moth of pomaceous fruits, in that it lays its eggs where two fruits touch, under the shelter of a leaf or the fruit, at the stem end of the fruit, and, in the case of



navel oranges, in the navel itself; in fact, anywhere that there is a likelihood of the egg not being disturbed. The egg hatches out into a small spotted caterpillar, which eats its way into the fruit, causing it to ripen prematurely, and fall off. Where two fruits touch, it often eats into and destroys both, and it frequently leaves one fruit to go and destroy a second. It is a very difficult insect to deal with, owing to the number of fruits and plants on which it lives; but, as far as citrus fruits are concerned, the best remedy is undoubtedly to spray the fruit with a remedy that will destroy the young insect when it starts to eat the skin of the fruit. Bordeaux mixture has been found efficacious, but I am of opinion that spraying with Paris green and lime, Kedzie's mixture, or arsenite of lead will also have good results. The latter poison is, in my opinion, well worth giving a thorough test, as it sticks to the fruit and leaves for a long time. Bordeaux mixture, either alone or in conjunction with Paris green or Kedzie's mixture, is, however, a good remedy, as not only will it destroy the larvæ or prevent the moth from attacking the tree, but it is also the best remedy for black brand or melanose, as well as tending to keep all other fungus pests in check. Fight fruit-fly systematically—both by means of the sticky fruit already recommended, and by gathering all fly-infested fruit, such as guavas, late mangoes, kumquats, &c., as well as any oranges or mandarins that may have been infested, as if kept in check now there will be little less throughout the season. A little fruit will be marketed towards the end of the month. See that it is gathered and sweated for seven days before marketing, and don't gather it too immature. Beauty of Glen Retreat mandarins are often gathered and marketed as soon as they show signs of colouring. They are then as sour as a lemon, and anyone who is unlucky enough to buy them will steer off mandarins for some time to come. This variety should not be gathered till thoroughly ripe, as when marketed in an immature state it spoils the market, as it puts people off eating citrus fruit.

Clean up the orchard after the summer rains, and have everything ready for the marketing of the crop. See that there is a good supply of clean, dry, case timber on hand, as one of the greatest sources of loss in shipment is packing fruit in green cases.

Strawberry-planting can be done throughout the month. Plant such berries as Federation on the low ground, and Aurie, Anetta, Trollop's Victoria, Glenfield Beauty on warm, well-drained soils. Prepare the land thoroughly, so that it is in perfect tilth, and in a fit state to retain moisture well; as on this, as much as anything, the success of the crop depends. Where new orchards are to be planted, get the land ready—not the clearing, which should have been done months ago, but the working of the land, as it is advisable to get it thoroughly sweetened before putting the trees in.

#### THE TROPICAL COAST DISTRICTS.

The Notes for February apply equally to March. See that bananas are netted—keep down weed growth, and market any sound citrus fruits. Clean up the orchards as well as possible, and keep pines clean. Get land ready where new orchards are to be set out, as tree-planting can be done during April and May. Pines and bananas can still be planted, as they will become well established before winter.

#### THE SOUTHERN AND CENTRAL TABLELANDS.

Finish the gathering of the later varieties of deciduous fruits, as well as grapes. Clean up the orchard, and get ready for winter. Get new land ready for planting; and where there are old, dead, or useless trees to be removed, dig them out, and leave the ground to sweeten, so that when a new tree is planted to replace them the ground will be in good order.

In the drier parts, where citrus trees are grown, keep the land well worked, and water where necessary.

VOL. XXII., PART 3.

[MAR., 1909.]

Registered at the General Post Office for Transmission by Post as a Newspaper.]

---



THE  
QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOL. XXII. PART 3.

---

MARCH,

---

By Authority:

BRISBANE: ANTHONY JAMES CUMMING, GOVERNMENT PRINTER.

1909.



## CONTENTS.

## AGRICULTURE—

PAGE.

State Farm, Roma.—Report on the Experiments with Winter Cereals carried out at the Farm during 1908 ... R. E. Soutter	117
A Prolific Wheat ... ..	125
A New Valuable Clover Plant ... ..	126
Farm Crops as Food for Stock ... .. J. C. Brünnich	126
Biggenden State Farm ... ..	130
Rotation of Crops ... ..	130
Farmyard Manure ... ..	132
An American's Address to Farmers' Boys ... ..	134
Lettuce Running to Seed ... ..	134
Preventing Waste of Silage ... ..	135
Practical Instruction in Judging Stock ... ..	135
Cotton-growing ... .. D. Jones	135
A New Double-headed Wheat ... ..	139
Another New Clover ... ..	139

## DAIRYING—

The Dairy Herd—Queensland Agricultural College, Gatton ...	140
Choosing a Dairy Bull ... ..	140
Curing Hams and Bacon ... ..	141
The Best Pork-producing Ration ... ..	142
A New Casein Test ... ..	142

## THE HORSE—

Sound Stallions ... ..	143
Broken Bones of Horses ... ..	143

## STATISTICS—

Rainfall of Queensland ... ..	144
-------------------------------	-----

## POULTRY—

Diseases of Poultry ... ..	145
----------------------------	-----

A LARGE STATION ... ..	146
------------------------	-----

## BOTANY—

Contributions to the Flora of British New Guinea	
F. M. Bailey, F.L.S.	147

## THE ORCHARD—

Codlin Moth-proof Apples ... ..	151
Fighting the Codlin Moth ... ..	151

SULPHUR FUMES FOR PRESERVING FRUIT ... ..	151
-------------------------------------------	-----

## APICULTURE—

	PAGE.
Prospects of an Export Trade in Honey ... ..	152
Some Uses for Honey ... ..	152
Mead ... ..	153
NEW ZEALAND FLAX MILLS ... ..	153
HORTICULTURE—	
Flower Gardening, No. 14 ... .. The Editor	154
TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1909 ... ..	163
TROPICAL INDUSTRIES—	
Caravonica Cotton ... ..	164
Demand for Sisal Fibre ... ..	164
SIBERIA ... ..	165
WORMS IN PIGS ... ..	165
GENERAL NOTES—	
The First Sheep in Australia ... ..	166
What Not Advertising Cost Him ... ..	166
Coal Tar for the Pumpkin Beetle ... ..	166
ANSWERS TO CORRESPONDENTS—	
Wire Fences ... ..	167
Cures for Warts on Poultry ... ..	168
Analysis of Carrots ... ..	168
THE MARKETS—	
Prices of Fruit—Turbot-street Markets ... ..	169
Southern Fruit Market ... ..	169
Prices of Farm Produce in the Brisbane Markets for February ...	170
Enoggera Saleyards ... ..	170
ORCHARD NOTES FOR APRIL ... .. A. H. Benson, M.R.A.C.	171
FARM AND GARDEN NOTES FOR APRIL ... ..	172
LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES ... ..	I.
DEPARTMENTAL ANNOUNCEMENTS ... ..	VII.
DIRECTIONS FOR FORWARDING SPECIMENS ... ..	VIII.



## NOTICE.

### Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,  
to cover postage.

To all other persons the annual subscription will be 10s., which will include postage.

All remittances should be made by postal notes or money orders, but where they are unobtainable stamps will be accepted, though the Department accepts no responsibility for any loss due to the latter mode of remitting.

For your convenience an Order Form is attached. A cross on each side of the Order Form indicates to the recipient that his subscription is again due.

Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

## ORDER FORM.

*To the Under Secretary, Department of Agriculture  
and Stock, Brisbane.*

*For the enclosed\* ..... please  
forward me THE QUEENSLAND AGRICULTURAL  
JOURNAL for One Year.*

Name.....

PLEASE WRITE PLAINLY. Address.....  
.....

Occupation.....

\* State amount according to above rate.

## Agriculture.

### STATE FARM, ROMA.

#### THE EXPERIMENTS WITH WINTER CEREALS, CARRIED OUT AT THE FARM DURING 1908.

R. E. SOUTTER, Manager, State Farm, Bungeworgorai, Roma.

#### METEOROLOGICAL.

After the heavy rains of March a dry spell set in. During April only .07 rain was registered, whilst there was none in May. These adverse conditions were partially relieved in June,  $\frac{1}{2}$  inch being recorded. This promoted germination on sandy soils, but on the clayey and heavier soils was of no benefit. It was not until the latter part of July that the droughty conditions were wholly dispelled, and from that time till crops were harvested no lack of moisture occurred. The precipitation did not result in quick growth immediately, owing to the continuance of cold weather, but with the advent of warmer weather the manner in which the crops responded was marvellous, and the ultimate results far better than could be reasonably expected.

The following is the rainfall recorded from 1st April to 30th November, 1908:—

Month.				Wet days.		Total rainfall.
April	...	...	...	1	...	.07
May	...	...	...	...	...	...
June	...	...	...	2	...	.50
July	...	...	...	7	...	1.27
August	...	...	...	5	...	.73
September	...	...	...	2	...	1.21
October	...	...	...	6	...	2.55
November	...	...	...	7	...	2.47
Total	...	...	...	30	...	8.70

#### SERIES A.

*Permanent blocks.*—Second season's results:—Area, 1 acre each. Variety of wheat experimented with, Bunge No. 1. Preparation of seed bed consisted of one double discing, two ploughings, and two harrowings. Seed was drilled in and harrowed.

Block No. 1.—Ploughed 4 in. deep. Sown 12th May. Germination uneven. Harrowed once, and rolled during growth. Harvested, 26th November. Yield, 13.4 bushels.

Block No. 2.—Ploughed 4 in. deep. Sown 12th May. Germination uneven. Harrowed once during growth. Harvested, 24th November. Yield, 14.2 bushels.

Block No. 3.—Ploughed 4 in. deep. Sown, 12th May. Germination uneven. Harrowed twice during growth. Harvested, 26th November. Yield, 14.1 bushels to acre.

Block No. 4.—Ploughed 4 in. deep. Sown, 11th May. Germination fairly even. Harrowed thrice during growth. Harvested, 21st November. Yield, 17.6 bushels.

Block No. 5.—Ploughed 5 in. deep. Sown, 11th May. Germination fairly even. Harvested, 21st November. Yield, 17.0 bushels. This block is to be ploughed 1 in. deeper each succeeding year, till a depth of 12 in. has been reached.



Block No. 6.—Ploughed 5 in. deep. Sown, 11th May. Germination fairly even. Harvested, 20th November. Yield, 20.9 bushels to acre.

Block No. 7.—Ploughed 6 in. deep. Sown, 9th May. No cultivation after seeding. Harvested 20th November. Yield, 26.1 bushels to acre.

Block No. 8.—Ploughed 6 in. deep. Rolled once during growth. Germination even. Harvested, 18th November. Yield, 25.7 bushels to acre.

Block No. 9.—Ploughed 6 in. deep. Harrowed once during growth. Germinated evenly. Harvested, 18th November. Yield, 26.0 bushels to acre.

Block No. 10.—Ploughed 6 in. deep. Sown, 9th May, at rate of 40 lb. seed to acre. Germinated evenly. Harvested, 18th November. Yield, 26.7 bushels to acre.

Block No. 11.—Ploughed 6 in. deep. Sown, 9th May, at rate of about 18 lb. seed to acre. Germination fairly even. Harvested, 19th November. Yield, 18 bushels to acre.

N.B.—A gully intersects this block, and influences results considerably.

Block No. 12.—Ploughed 6 in. deep. Sown, 9th May. Harrowed twice during growth. Germination fairly even. Harvested, 19th November. Yield, 20.2 bushels.

Block No. 13.—Ploughed 6 in. deep. Sown, 9th May. Drilled in 4 in. (approx.) deep. Even germination. Harvested, 19th November. Yield, 19.4 bushels to acre.

Block No. 14.—Ploughed 6 in. deep. Sown, 11th May, 3½ in. deep. Germination even. Harvested, 19th November. Yield, 19.6 bushels to acre.

Block No. 15.—Ploughed 7 in. deep (approx.). Sown, 11th May. Germination fairly even. Harvested, 20th November. Yield, 18.6 bushels.

Block No. 16.—Ploughed, 8 in. deep. Rotation crop of panicum every second year. Sown, 11th May. Harvested, 20th November. Yield, 18.4 bushels.

Block No. 17.—Ploughed 8 in. deep. Cropped with pumpkins every second year. Sown, 11th May. Germination fairly even. Harvested, 21st November. Yield, 18.6 bushels.

Block No. 18.—Ploughed 8 in. deep. Cropped with rape every second year. Sown, 12th May. Germination uneven. Harvested, 26th November. Yield, 17.8 bushels.

Block No. 19.—Ploughed 8 in. deep. Cropped with cowpea every second year. Sown, 12th May. Germination uneven. Harvested, 26th November. Yield, 15.4 bushels.

Block No. 20.—Ploughed 8 in. deep, bare fallow every other year. Sown, 12th May. Germinated unevenly. Harvested, 26th November. Yield, 15.6 bushels to acre.

Remarks.—In order that the foregoing results may not be misleading, I may mention that the soil in blocks 1, 2, 3, 19, and 20 is much inferior to that found in 4, 5, 6, 15, 16, 17, and 18, which is again inferior to that in blocks 7, 8, 9, 10, 11, 12, 13, and 14.

#### SERIES B.

Scientific soil culture. (Prof. Campbell's method.)

*Location.*—Paddock B, Block 2. Area, 8 acres. It is to be regretted that nothing further has been learned as to the value of this system this season, due to the fact that the work carried out last season was rendered futile by the heavy rains experienced in February and March last, washing off the surface soil and cutting numerous gullies through the blocks. This necessitated, in order to obtain sufficient soil to cover seed, the turning up of the subsoil over a great portion of the area. Heavy rains since experienced have further decreased the possibility of producing crops here; indeed, have made the ground so broken as to practically debar the working of implements over it.

*Cultivation.*—Preparation of seed bed since previous crop was removed, has necessitated four ploughings, three double discings, ten harrowings, and

one packing. The condition of the soil in this block at seeding time was the reverse of what it would have been had nothing interfered with the proper working of the system, hence the results obtained are valueless, as preparation of seed bed is the chief factor. The variety sown, results, &c., are as follows, viz.:—

J. Brown.—Area, 4.6 acres. Sown, May, 3rd week. Harvested, November, 4th week. Yield, 10.3 bushels to acre. Grain poor.

Remarks.—Crop very uneven, owing to uneven quality of soil. Height ranging from 2 ft. 6 in. down to 9 in.

Bunge No. 1.—Area, 2.9 acres. Sown, August, 1st week. Harvested, November, last week. Yield, 8 bushels to acre.

Remarks.—Soil much inferior to that in portion allotted to J. Brown. Crop uneven, height ranging from 2 ft. down to 9 in. Grain very fair.

Paddock C.—Block 2. Area, 10 acres.

Alluvial Flat.—Not sown.

This block, which lies in a depression on west bank of creek, was also rendered unfit for sowing this season by the heavy rains in the early part of the year, which caused the Bunge to overflow its banks, and rush over this area.

The ill effects will not be so lasting here as on Block 2, Paddock B (though much more soil was removed), as the soil is much deeper and is only subject to scour when floods occur.

Cultivation of this area, owing to the dry spell which supervened, the rains, which did the damage, was delayed until August, when it was again ploughed, which did not result in a tilth being obtained to warrant seeding: indeed, at time of writing, it is not in a condition to receive a crop, though it has been cultivated (ploughed) twice since.

#### SERIES C.

Area of blocks, half an acre.

The cultivation of the area devoted to these blocks has been carried out in a similar manner to that advocated by Prof. Campbell, with the exception that the sub-surface packer was not employed, and it was hoped by so doing to ascertain, by comparing the results here with those obtained where it was used, the real value of the implement. Owing to the fact that the experiments which entailed the use of the implement were rendered worthless by untoward circumstances, nothing in this direction has been accomplished, though the further testing of a number of varieties has been made.

*Preparation of seed bed.*—1907.—Bare fallow, maintained in a state of good tilth. Twice ploughed, twice double disced, and harrowed five times.

1908.—Twice ploughed, once double disced, and harrowed five times.

Cost per acre, 27s. 6d., approx.

The variety tested with results, &c., being as follows:—

Bunge No. 1.—Sown, 4th August. Earing, October, 2nd week. Harvested, 27th November. Yield, 23 bushels to acre.

Hermitage No. 2.—Sown, May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 16.6 bushels to acre.

Remarks.—A good deal of grain was lost, owing to crop having been flattened down by a storm; rather long in straw.

Arnantka—Durum wheat.—May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 11.2 bushels to acre.

Moulds.—Sown, May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 16.9. A fair quantity of grain was lost owing to crop having been blown down by storm.

Farrer's Durum—Macaroni.—Sown, May, 1st week. Harvested, December, 2nd week. Yield, 10.8 bushels to acre.



Plover.—Sown, May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 16.3 bushels to acre. Rather short straw, which is a desirable quality.

Turkey—Durum wheat.—Sown, May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 13.6 bushels to acre.

Rymer.—Sown, May, 1st week. Earing, October, 1st week. Harvested, December, 2nd week. Yield, 13.0 bushels to acre. Worthy of further trial. Short straw.

Velvet Don—Durum.—Sown, May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 13.0 bushels to acre.

Sussex.—Sown, May, 1st week. Earing, October, 1st week. Harvested, December, 2nd week. Yield, 21.5 bushels to acre.

Alpha.—Sown, 23rd June. 14 lb. to acre. Earing, September, 4th week. Harvested, December, 2nd week. Yield, 22.8 bushels to acre. To all appearances this season, this wheat, which was introduced from Western Australia, is a very desirable variety to grow. Prior to a storm, which resulted in not much more than half the grain being garnered, it gave promise of giving the heaviest yield of any variety grown. The reason of its falling down was not wholly due to a defect in the plant, but, in a great measure, to the fact that the drills were sown 14 in. apart, and so the plants afforded each other very little protection or support. It should prove a good hay wheat—fine, and stout in straw, flag very coarse, head compact, well filled, does not shed grain, large, of pleasing appearance.

Should this variety come through a rusty year it will be an acquisition to the varieties now in favour. After subsequent field tests the results in this particular will be made known.

Manitoba (Roma Mill Seed).—Sown, May, 1st week. Earing, October, 2nd week. Harvested, December, 2nd week. Yield, 15.8 bushels to acre. Grain pinched. This variety has again demonstrated that it is wholly unsuitable for this district.

#### SERIES D.

##### Quarter Acre Blocks.

Cultivated in a similar manner to Block C, with this exception: that double discing was substituted for the final ploughing, the ground not having set here as elsewhere, being of a more loamy nature. All seed sown was drilled in as deep as machine would permit, and was above ground eight days from sowing, notwithstanding the very limited amount of rain.

Bobs.—Sown, May, 1st week, 25 lb. to acre. Earing, August, 3rd week. Harvested, November, 1st week. Yield, 24.9 bushels to acre. Medium long straw, rather weak, sheds easily, also weathers. Liable to be frosted if sown too early in low situations.

Bunyip.—Sown, May, 1st week, 25 lb. to acre. Earing, August, 2nd week. Harvested, November, 1st week. Yield, 22.5 bushels to acre. This is the earliest wheat grown here, and was slightly frosted; has a short stout straw, compact well-filled head, though liable to rust; escapes it if sown at right time, through its earliness. Has proved fairly consistent up to the present.

Federation.—Sown, May, 1st week, 25 lb. to acre. Earing, August, 3rd week. Harvested, November, 1st week. Yield, 26 bushels to acre. This is a short-strawed wheat; it has proved susceptible to rust here, but withstands droughty conditions well. Grain of good appearance, round, plump.

Australian Crossbred, 73.—Small sample of seed obtained from Chapman Experimental Farm, Western Australia. Sown, May, 2nd week, 12 lb. to acre. Earing, August, 3rd week. Harvested, November, 1st week. Yield, 32.2 bushels to acre. Medium long straw, stout, good stripper, does not shed easily, stools well. Grain good appearance.



Yandilla King.—Seed obtained from South Australia. Sown, May, 2nd week, 20 lb. to acre. Earing, September, 2nd week. Harvested, November, 1st week. Yield, 25.4 bushels to acre. This is a short-strawed wheat, good stooler, heads short, well filled, and from results obtained in South Australia is a very suitable wheat for any locality. Grain small, plump.

Nhill.—Procured from same source as previous mentioned variety. Sown, May, 2nd week, 15 lb. to acre. Earing, September, 1st week. Harvested, November, 1st week. Yield, 37.6 bushels to acre. Medium long straw, stout, ear long, and droops sufficiently to throw off moisture, and still not prove detrimental when stripping; glumes close, does not shed easily, strips well. Grain large.

Comeback, "Pratts."—South Australia. Sown, May, 2nd week, 28 lb. to acre. Earing, September, 4th week. Harvested, November, 2nd week. Yield, 35.48 bushels to acre. Medium short straw, stools well, good stripper. As this and the two previous mentioned wheats have not been grown here previously, nothing can be said as to their rust-resisting qualities.

Garton's Red King (Imported 1908).—Sown, May, 1st week, 20 lb. to acre. Earing, October, 3rd week. Harvested, December, 2nd week. Yield, 3.5 bushels to acre. Grain sown very weevily, germination poor, crop very thin. Rusty. Straw stout, strong, very flaggy. Coarse flag, bald, head close, compact. Very slow in maturing. Requires sowing much earlier than was done here this season.

Garton's New Era (Imp. 1908).—Sown, May, 1st week, 26 lb. to acre. Earing, October, 3rd week. Harvested, December, 2nd week. Yield, 10.4 bushels to acre. Ears slightly bearded with coarse awns, black. Head extremely long, and would, under suitable conditions, produce very heavy yield. Remarks applied to previous wheat apply here.

#### MISCELLANEOUS BLOCKS AND VARIETIES.

Correll's No. 2.—Area, 4 acres. Sown, 1st May. Earing, October, 2nd week. Harvested, December, 1st week. Yield, 14.4 bushels to acre. This was the first crop sown, and one of the last to mature, and had it not been for the rains experienced during September, no grain would have been harvested. Where others gave promise of fair yields of grain, this variety was only a few inches high, clearly demonstrating that it is not a suitable kind to continue growing in large areas, as it is too slow in responding to showers for this district.

Correll's No. 2.—Area, 4 acres. Sown, 1st May. Earing, October, 2nd week. Harvested, December, 1st week. Yield, 16 bushels to acre. Seed very mixed. Further remarks as applied to Correll's No. 2.

Cretain—Durum wheat (bearded).—Sown, 2nd May. Earing, October, 2nd week. Harvested, December, 1st week. Yield, 10.4 bushels to acre. Poor stooler, straw fine, strong, nearly solid, beard causes great inconvenience both in stripping and winnowing. More suitable for coastal cultivation.

Kubanka—Durum wheat (bearded).—Sown, 5th May. Earing, October, 3rd week. Harvested, December, 2nd week. Yield, 6.1 bushels to acre. Portion of the block on which this variety was growing is black soil, and germination there did not take place till September, whereas on the lighter portion the wheat appeared above ground ten days from sowing. Though the yield is low, this variety may be considered the best of its class when grown under favourable conditions. Stools well, large head and grain, strong, medium, stout, straw tall. Like all bearded wheats, it is troublesome to strip and winnow.

Le Huguenot—Durum wheat (Bald Medeath).—Sown, 24th June. Earing, October, 1st week. Harvested, December, 2nd week. Yield, 4.1 bushels to acre.



This variety has again proved that it is not worth continuing with, and is about the poorest of its class, and, notwithstanding that it has the advantage of being beardless, it is far more difficult to clean and strip than others.

Bunge No. 1.—Area, 4.5 acres. Sown, 23rd June. Earing, September, 2nd week. Harvested, November, 3rd week. Yield, 22.2 bushels to acre. The soil in this block ranged from a rich sandy loam to a raw sand. On the first-mentioned kind the crop grew to a height of 5 ft. 6 in., and the estimated yield was between nine and ten bags to the acre. Over the remainder the crop was only about 2½ ft. high, and very thin.

Baltic Red (Local variety).—Area  $\frac{3}{5}$  of an acre. Sown, 23rd June. Earing, October, 3rd week. Harvested, December, 2nd week. Yield, 6 bushels to acre. This and the afore-mentioned crop, as will be seen, were sown on the same day in the same field. When the Bunge No. 1 gave promise of a four-bag crop, this variety was only a few inches high, and very poor.

*Samples.*—Small areas of about 1/100 of an acre were sown with new varieties, and those varieties previously grown here, whose behaviour did not warrant larger areas being sown.

Lot 1.—Seed obtained from Roseworthy Agricultural College, &c. Sown, 13th May, at rate of 15 lb. to acre. Harvested, December, 2nd week.

	Variety	Yield per acre.		Remarks.	
		Bushels.			
Hermitage.	S. Aust. No. 50	...	8.5	...	Smutted and down.
	„ 51	...	9.3	...	Down; fairly good.
	„ 52	...	13.6	...	Good; erect.
	„ 53	...	13.6	...	do.
	„ 54	...	11.2	...	do.
	„ 55	...	12.3	...	Smutted.
	Bald Medeah	...	4.5	...	Worthless.
	Bobs	...	12.9	...	Good, shed slightly.
	College Purple Straw	16.1	...	Good.	
	Comeback C...	...	12.5	...	Good, shed slightly.
	Cumberland	...	10.7	...	Fair.
	Federation	...	24.6	...	Splendid heads, short straw, grain very good.
	Hudson's E. P. Straw	24.2	...	Worthy of further trial.	Grain good.
	Jumbuck	...	16.0	...	Down as a result of storm. Large grain.
	Leak's R. R.	...	13.2	...	Large grain; pinched.
	Marshall's No. 3	...	12.1	...	Blown down; slightly pinched.
	Red Fife D	...	6.1	...	Wholly unsuited to the district.
	Silver King	...	12.2	...	Large grain; pinched.
	Stanley D	...	7.6	...	Poor; very pinched.
	Steinwedel Imp.	...	14.1	..	Sheds blown down.
	Wallace	...	12.2	...	Blown flat.
	Warden Haywheat	...	11.8	...	Other variety would have proved more suitable for hay. Medium early.
	White, Essex C	...	8.6	...	Very poor; late.
	White, Fife D	...	9.7	...	Poor; grain pinched; late.
	99 C, 23 A2	...	13.0	...	Stout erect straw. Mid-season.
	40 K2	...	13.6	...	do.
	K3, 91	...	10.6	...	Very poor stooler. Mid-season.
	J. C. 157	...	13.5	...	Stout erect straw. Mid-season.

Lot 2.—Previously grown here. Sown, 13th May, 28 lb. to acre. Harvested, December, 2nd week. Ground practically a clay-pan.

Variety.	Yield per Acre.		Remarks,
	Bushels.		
Belotourka ...	7.6	...	Durum var., long straw.
B. Don ...	5.3	...	do. Medium. Coarse straw.
13 Budd's Early ...	10.5	...	Stood up well; grain plump.
Gharnooka (Yellow) ...	5.3	...	Bearded; seed originally obtained from America.
Jonathan ...	7.6	...	Poor grain; pinched. Mid-season.
Lofthouse ...	7.6	...	Poor grain; pinched; late. Wholly unsuitable. Introduced from America.
Morocco ...	9.6	...	Durum wheat; short straw; coarse, bearded.
Odessa ...	8.4	...	Poor grain; pinched. Too slow in maturing.
Russian Ulks ...	7.6	...	Grain poor; late.
Schneider ...	10.0	...	Grain fair mid-season.
Select Fife ...	4.6	...	Very pinched; too slow; seed from America.
Tarragon ...	8.4	...	Grain pinched; rather late.
Minnesota B. S. ...	4.0	...	Very poor grain; very pinched. Wholly unsuitable. Original seed from America.
Power's Fife ...	7.2	...	Poor; late.
Crossbred No. 12 ...	7.6	..	Poor stooler; medium early.
„ 25 ...	10.0	...	Fairly good; „
„ 33 ...	12.2	...	Grain good; „
„ 50 ...	10.7	...	Grain fair; „
„ 53 ...	10.5	...	do. „
„ 91 ...	7.2	...	Very thin; „
„ 121 ...	9.2	...	Grain fair; „
„ 181 ...	10.7	...	do. „
„ 343 ...	8.8	...	Grain medium; weak straw; medium early.
„ 348 ...	11.5	...	Grain good; medium early.
„ 349 ...	14.3	...	do. medium early; good straw.
„ 353 ...	12.2	...	Grain good; medium early.

Usher's Rust Resister.—Sown, 4th August. Earing, October, 4th week. Harvested, December, 2nd week. Yield, 5.3 bushels to acre. Seed received from Transvaal Department of Agriculture, Pretoria. Nothing definite can be stated as to the variety proving suitable or otherwise here, as the seed was sown very late in the season, and has not yet become acclimatised. Is fully three weeks longer in coming to maturity than Bunge No. 1. Seeds of other varieties were received, but, owing to the unfavourable conditions at ordinary seeding time, were not sown.

#### OTHER CEREALS.

##### BARLEY.

This crop has again proved a partial failure, owing to the lack of surface moisture when required. The yields were considerably reduced by a heavy rain storm accompanied by hail and wind, which blew down the crop and threshed out the grain. The varieties sown and results obtained were as follow, viz.:—

Hallett's (Imp. Chev. Barley,  $\frac{1}{2}$ -acre).—Sown, May. Earing, September, 2nd week. Harvested, November, 4th week. Yield, 5 bushels to acre. Fully half of this crop was lost.



"Carters" Malting Barley (Area, 1 acre).—Sown, 1st May. Earing, September, 3rd week. Harvested, November, 4th week. Yield, 10.7 bushels to acre. A fair quantity of grain was lost over this block.

Invincible.—Area, 1 acre. Sown, May, 1st week. Earing, September, 2nd week. Harvested, November, 4th week. Yield, 8.5 bushels to acre. Very little grain was lost here, but crop was very thin, hence difference in yield.

#### OATS.

Two varieties were sown, the seed of which was obtained from Garton's, Limited, Warrington, England. For preparation of seed bed see Series D.

#### *Results, &c.*

Universal Oat (white)—area,  $\frac{1}{4}$  acre.—Sown, May, 1st week. Harvested, October, 4th week. Yield, 15 bushels to acre. Straw and flag very coarse. Height, 4 ft. Crop very poor till after September rains.

Bountiful Oat (black)—area,  $\frac{1}{4}$  acre.—Sown, May, 1st week. Harvested, December, 1st week. Yield, 7 bushels to acre. Very poor; probably due to proximity of trees in adjacent paddock.

#### *Hybridising.*

1907 Crosses.—Owing to the depredations of grasshoppers, only five plants came to maturity out of the seed sown. Two crosses exhibited characteristics totally different to either parent. Further sowings will be made of these next year.

1908.—This season this branch of work has been continued, and confined to a few of the leading varieties, which possess undesirable characteristics, such as being too fine or long in straw, too open in glumes, &c. The elimination or reduction of these undesirable features has been aimed at, and when crossing the selection has been made with this object in view.

16 Bunge No. 1, which has proved the best all-round wheat on the farm, is inclined to grow too tall on rich soil, and, as the straw is fine, has a tendency to come down in a storm. In an endeavour to overcome this feature, 293 crosses have been made with three short-strawed varieties. This variety is also open in the glumes, the result being that very little rain causes discolouration. Eighty-three individual crosses with three close-glumed varieties have been made with a view of producing a plant without this defect.

In addition to the foregoing, 184 other crosses have been made with six good varieties. These 560 new crosses will afford interesting comparisons next season, and, it is to be hoped, certain valuable data.

#### FUNGOID DISEASES.

Rust.—A little rust made its appearance on the most susceptible variety in the early part of September, but the conditions were evidently not favourable to its development, and it disappeared, and was not in evidence again till the 1st week in December, when it appeared in a virulent form on the only two green crops at the time—viz., Garton's Red King and Garton's New Era.

Smut.—Garton's Universal and Bountiful Oats, the only variety of this cereal grown, were badly infested with smut. This is the first season that ball smut has been found here, and was present in crops resulting from seed received in sample packets which originally came from South Australia and other sources. The varieties infested were:—Leak's R. R., South Australian wheats Nos. 50 and 55. As these crops were the last removed, all grain previously harvested is free of spores. The area utilised by infested varieties contains only  $\frac{1}{30}$  of an acre, and is in next season's fallow block, so that the danger of infection from this source is reduced to a minimum, providing only treated seed is sown.



## OTHER PESTS.

*Grasshoppers* were present in the early part of the season, but did no material damage to field crops.

*White Ants*.—Isolated plants were killed by these.

*Caterpillars*.—A small caterpillar which finds its way into the stalk of wheat at the top node, causing the ear to dry off, was noticed.

## SUMMARY OF RESULTS OF OBSERVATIONS DURING 1908.

*Unsuitability of varieties from grain point of view.*

*Fife wheats*.—These wheats are too late in maturing for this portion of the State at least, as the summer sun causes the crop, in five years out of six, to ripen off before grain is filled, and the berry has the same appearance as that resulting from a very rusty crop.

*Durum wheats*.—Up to the present these wheats have been amongst the lowest yielders we have. The only year in which they gave a payable return as a whole was a wet one, and, as they were introduced on account of their reputation as dry-belt wheats, this is disappointing. Even had they proved as suitable in this respect as some of our own, it is improbable that they would be extensively cultivated, as the beards (awns) render harvesting a much slower operation than it is with bald varieties.

*Suitable variety*.—Wheats having either a short straw or a medium long, stout straw, with very little flag, and which mature quickly, are evidently the most suitable varieties for this climate. The shorter-strawed varieties are preferable, as they probably require less moisture to grow, have less surface for evaporation, do not obtain so much momentum in a strong wind, thereby reducing the danger of shedding, and are not nearly so liable to being blown down by storms. Ability to resist rust is also a feature of importance.

*Best time for sowing*.—May is the most suitable month for sowing most varieties in most situations in this district. Quick maturing kinds such as Bobs, Bunyip, Federation, Bunge, &c., in low-lying situations, should not be sown till the latter part of the month, unless they can be grazed off in the event of being too forward, this being necessary in order to avoid being frosted. This season an August sowing of Bunge No. 1 yielded 23 bushels to the acre, but the year before last, rust, which reduced the yield of the Maranoa so much, made its appearance this month, and, had the conditions been favourable to its propagation this season, very little would have been obtained, if any, from this area, whereas those sown in May would have been very little reduced.

*Seed*.—The same results have been obtained from sowing  $\frac{1}{4}$  and  $\frac{1}{2}$  bushels to the acre (drilled). Though nothing conclusive has been arrived at, the following has been noted:—The thinner seeded areas were the most weedy, and the crops were more inclined to be blown down by storms. This was due to the fact that, in order to sow the limited quantity, it was necessary to stop up every other tube, making the drills 14 in. apart. This distance prevented the plants supporting one another as they do when sown 7 in. apart. Grading of seed has given the following results, viz.: A more even seeding; as a result, plants are not overcrowded, germination is more even, stronger plants are produced, which establish themselves under conditions which would prove fatal to those originating from pinched grain.

---

A PROLIFIC WHEAT.

During 1908 the Department of Agriculture and Stock distributed, gratis, several varieties of seed wheat to farmers in the wheat districts of the State, for the purpose of introducing and establishing new and proved kinds, and many reports on the results have been received from the recipients. Amongst



others, is a report from Mr. A. M. Griffin, of Roma, who last season sowed 1 bushel of No. 1 Bunge wheat. The seed was sown on the 25th May, and the crop harvested on the 10th November, 1908. The yield from this single bushel amounted to 75 bushels, being the best yet recorded for this or any other variety distributed by the Department. Mr. Griffin, in his report, says that the methods of cultivation adopted on the State Farm are of great value to wheat-growers, and he recommends proceeding on the same lines, with special reference to the after-cultivation of growing crops by frequent harrowings. He is so satisfied with the result of his experiment that he intends sowing 50 acres of this wheat in the coming season.

---

### A NEW VALUABLE CLOVER PLANT.

New Zealand "Farm" describes a new clover plant (*Hedysarium coronarius*), commonly known as Maltese Clover, which has been placed on the market by Mr. W. C. Callaghan, of Wellington, N.Z. It is a native of Southern Italy, but is peculiarly adapted to New Zealand soils, and grows strong and healthy, with richly-coloured flowers. The stems are succulent and full of saccharine matter, and are much relished by stock. The clover surpasses other fodders on account of its nutritious qualities, and produces abundant crops on poor, sandy soils, and will continue bearing for many years. Mr. Callaghan has been experimenting for some time, and assures us that the plant is easily grown, and attains a height of 4 ft. The clover grows from 18 in. to 2 ft. in two months, and can be cut twice a year. There is no better plant for ensilage purposes, and for hay it is excellent. The seeds should be sown in drills 18 in. to 2 ft. apart. Bees are particularly partial to the fragrant flowers of this clover.

It is exceptionally valuable for sheep and lambs, as it contains a considerable quantity of saccharine matter, which is an important factor in food for stock.

We have consulted the Colonial Botanist, Mr. F. M. Bailey, F.L.S., on this plant. He says it has long been cultivated in France, and in Calabria, in Italy, where it grows to a height of 4 ft. It will not, however, bear the climate of Queensland, where it has often been tried, but has invariably proved a failure.—Ed. "Q.A.J."

---

### FARM CROPS AS FOOD FOR STOCK.

By J. C. BRUNNICH, Agricultural Chemist.

At the time when green feed is getting scarce, farmers often desire to know what quantities of dry fodders and concentrated food stuffs have to be supplied to stock in order to keep them in good condition. For this purpose I have prepared some tables, which are partly based on the results of our own analyses, and partly on the results obtained elsewhere, giving the amounts of **digestible nutrient in various foods**.

The question of **feeding farm stock** was dealt with fairly fully in my 19th lecture on the "Chemistry of the Farm, Dairy, and Household" ("Queensland Agricultural Journal," October, 1907), and I can only repeat here that the animals have different powers of digestion, and that ruminants digest much larger proportions of the nutrients in the foods than non-ruminants, like horses and pigs. Green foods, again, are, as a rule, more easily digested than dry foods.

**Table I.**, taken from the lesson already mentioned, shows the quantities of nutrients required per day and per 1,000 lb. of live weight. An ox at rest

requires only about  $\frac{3}{4}$ -lb. of proteins (nitrogenous compounds, flesh-formers) per day, whereas the same beast, heavily worked, would require nearly  $2\frac{1}{2}$  lb. of proteins.

Pigs, in their earliest period of growth, require a more nitrogenous feed than when they get older. A pig nine to twelve months old would require, as it weighs about 250 lb., one quarter of the quantities given, say,  $\frac{1}{4}$  of 3 lb. =  $\frac{3}{4}$ -lb. of proteins,  $\frac{1}{4}$  of 18.3, or 4.6 lb. of carbohydrates.

The quantities of digestible nutrients, as digested by ruminants, are given on **Table II.**, from which table any food ration can be calculated.

We find, for instance, that in 100 lb. of lucerne hay we get  $12\frac{1}{2}$  lb. of protein, nearly 48 lb. of carbohydrates, which include digestible fibre, starch, sugars, &c., and 1.2 lb. of crude fat.

To make calculation still easier, I prepared a further table (**Table III.**) which gives the quantities of each fodder in pounds required to supply a proper ration to a milking cow of 950 lb. to 1,000 lb. live weight, and yielding about 25 lb. of milk (nearly 10 quarts) a day. We will see from the table that, for instance, 26 lb. of lucerne hay are required to supply the amount of total solid matter, only 20 lb. are required to supply the necessary protein, and 33 lb. are required to supply all the carbohydrates. The reason is that lucerne contains almost too much nitrogenous material compared with the carbohydrate nutrients, the nutritive ratio being from 1:2.2 (green lucerne) to 1:3.2 (lucerne hay), whereas a cow requires a ratio of about 1 part of digestible proteids to 5.4 parts of digestible carbohydrates, including fat.

If we feed, therefore, cows entirely on lucerne, we supply more nitrogenous material than necessary, which, therefore, may go to waste, and it is advantageous to feed a lesser quantity of lucerne hay, and supplement with such feeds containing comparatively higher amounts of carbohydrates and fats, or of a wider nutritive ratio, like wheat straw, oaten straw, bush hay, potatoes, &c.

A simple application of the tables will show how rations may be mixed from various feeds; and, if the price of the food is known, it is easy to calculate the cost of each ration.

A closer study of the tables will prove the great value of the by-products—bran, pollard, and oil cakes—as cattle foods.

How little value prickly pear leaves have as feed for cattle is shown by the enormous quantities which have to be consumed by an animal in order to get a complete ration, and only if this feed would be supplemented with concentrated foods like oil cake the beasts could be kept in good condition.

Correspondents have repeatedly inquired about the value of sugar-cane tops, and it will be seen that the value of chop-chop made from green sugar-cane tops comes very closely in its feeding value to maize and sorghum.

Saltbush, again, has a very high feeding value.

**Table I.**

**FEEDING STANDARDS.**

*Digestible Nutrients Required per Day and per 1,000 Lb. Life Weight.*

—	Lb. of :	Total Dry Matter.	Proteins.	Carbohydrates.	Fat.	Nutritive Ratio.
Milch cow	...	24.0	2.5	12.5	.4	1 : 5.4
Ox at rest	...	17.5	.7	8.0	.2	1 : 12
Ox heavily worked	...	26.0	2.4	13.2	.5	1 : 6
Horse moderately worked	...	22.5	1.8	11.2	.6	1 : 7
Horse heavily worked	...	25.5	2.8	13.4	.8	1 : 5.5
Fattening pigs, 2 to 3 months	...	44.0	7.6	28.0	1.0	1 : 4
"    "    5 to 6    "	...	33.0	4.3	22.3	.6	1 : 5.5
"    "    9 to 12  "	...	26.0	3.0	18.3	.3	1 : 6.4



Table II.

## COMPOSITION OF FOODS.

Total Dry Matter and Digestible Nutrients in 100 Lb. of Food.

	Total Dry Matter in 100 Lb.	DIGESTIBLE NUTRIENTS..			Nutritive Ratio.
		Proteins.	Carbohydrates, Fibre, Starch, and Sugars.	Crude Fat.	
<i>Hay and Straw—</i>					
Lucerne ... ..	91.4	12.5	37.8	1.2	1 : 3.2
Paspalum ... ..	91.9	5.6	43.0	.6	1 : 7.9
Prairie grass ... ..	91.1	7.8	43.5	.8	1 : 5.8
Canary grass ... ..	88.7	8.7	40.0	.9	1 : 4.8
Wheat straw ... ..	90.4	.4	36.3	.4	1 : 93
Oaten straw ... ..	90.8	1.2	38.6	.8	1 : 33.7
Bush hay ... ..	93.5	3.5	49.2	1.0	1 : 14.7
<i>Ensilage—</i>					
Sorghum ... ..	23.6	.8	13.6	.4	1 : 18.1
Maize ... ..	21.6	1.1	11.5	.3	1 : 11.0
<i>Green Fodders—</i>					
Bush grass ... ..	38.9	3.0	18.3	.4	1 : 6.4
Couch grass ... ..	34.5	3.6	15.8	.2	1 : 4.5
Paspalum ... ..	27.2	2.0	12.8	.2	1 : 6.6
Lucerne ... ..	23.8	3.8	7.8	.3	1 : 2.2
Cowpea vines ... ..	21.1	3.4	12.5	.5	1 : 4.0
Sweet potato vines ... ..	12.4	1.4	5.1	.2	1 : 4.0
Sorghum ... ..	32.1	1.7	15.4	.3	1 : 9.5
Maize ... ..	25.4	1.3	13.5	.2	1 : 10.8
Sugar-cane tops ... ..	28.8	1.4	14.8	.4	1 : 9.8
Prickly-pear leaves ... ..	5.6	.3	2.3	...	1 : 7.7
Saltbush ... ..	20.8	2.9	7.8	.4	1 : 3.1
<i>Roots and Tubers—</i>					
Potatoes ... ..	21.1	.9	16.3	.1	1 : 20.6
Sweet potatoes ... ..	28.9	.8	23.7	.3	1 : 30.5
Mangolds ... ..	9.1	1.1	5.4	.1	1 : 5.1
Swedes ... ..	11.4	.8	7.0	.1	1 : 9.0
Pumpkins ... ..	9.1	1.0	5.8	.3	1 : 6.5
<i>Grains—</i>					
Maize ... ..	88.0	9.9	62.1	4.7	1 : 7.3
Wheat, plump ... ..	88.5	9.5	49.9	1.4	1 : 5.6
Wheat, shrunken ... ..	91.7	13.7	47.6	1.4	1 : 3.7
Barley ... ..	90.0	9.6	63.5	2.1	1 : 7.1
Oats ... ..	89.0	9.2	47.3	4.2	1 : 6.2
Peas ... ..	89.5	16.8	51.8	.7	1 : 3.2
Kafir corn ... ..	90.7	7.5	70.5	2.6	1 : 10.2
<i>By-products—</i>					
Wheat bran ... ..	88.3	11.2	42.2	2.5	1 : 5.1
Wheat pollard ... ..	88.3	12.2	53.4	3.8	1 : 5.1
Cocoa-nut oilcake ... ..	85.9	16.4	42.4	9.7	1 : 3.9
Cotton-seed meal ... ..	90.2	41.1	15.4	11.0	1 : 1.0
Molasses ... ..	75.0	...	55.0	...	...

Table III.  
FOOD EQUIVALENTS.

Pounds of Digestible Nutrient Required by a Cow of 950 to 1,000 Lb. Live Weight Yielding up to 25 Lb. Milk Daily.

	Total Dry Matter.	Proteins.	Carbohydrates and Fat.
	24.0	2.5	13.4
These Digestible Nutrients are contained in Lb. of Food.			
<i>Hay and Straw—</i>			
Lucerne ... ..	26	20	33
Paspalum ... ..	26	45	30
Prairie grass ... ..	26	32	30
Canary grass ... ..	27	29	32
Wheat straw ... ..	26	625	36
Oaten straw ... ..	26	208	33
Bush hay ... ..	26	71	26
<i>Ensilage—</i>			
Sorghum ... ..	103	312	92
Maize ... ..	111	227	110
<i>Green Fodders—</i>			
Bush grass ... ..	62	83	70
Couch grass ... ..	70	69	82
Paspalum ... ..	89	125	101
Lucerne ... ..	101	66	158
Cowpea vines ... ..	114	74	98
Sweet potato vines ... ..	194	178	239
Sorghum ... ..	75	147	83
Maize ... ..	95	192	96
Sugar-cane tops ... ..	83	178	98
Prickly-pear leaves ... ..	430	833	582
Saltbush ... ..	115	86	150
<i>Roots and Tubers—</i>			
Potatoes ... ..	114	278	72
Sweet potatoes ... ..	83	312	55
Mangolds ... ..	264	227	248
Swedes ... ..	210	312	186
Pumpkins ... ..	264	250	206
<i>Grains—</i>			
Maize ... ..	27	25	18
Wheat, plump ... ..	27	26	25
Wheat, skrunken ... ..	26	18	26
Barley ... ..	27	26	20
Oats ... ..	27	27	24
Peas ... ..	27	15	25
Kafir corn ... ..	26	33	17
<i>By-products—</i>			
Wheat bran ... ..	27	22	23
Wheat pollard ... ..	27	20	22
Cocoa-nut oilcake ... ..	28	15	21
Cotton-seed meal ... ..	27	6	33
Molasses ... ..	32	...	24



### BIGGENDEN STATE FARM.

The State Farm at Biggenden, situated some 54 miles from Maryborough, on the Gayndah line, although not of very large extent, holds a foremost place amongst similar State institutions. The manager, Mr. D. MacPherson, notwithstanding the prevalence of dry weather, has succeeded in producing some admirable crops of maize, sorghum, cowpeas, kafir corn, &c., as may be seen by the accompanying illustrations.

The soil of the farm is generally black and fertile. On such a soil was produced the fine crop of maize here depicted. It was only ten weeks old when the photograph was taken, and promised a very heavy crop.

The red kafir corn was about four months old, and not quite ripe. It was grown on similar soil and under similar weather conditions as the maize, and was estimated to yield 60 bushels per acre, the previous yield having reached 70 bushels.

A sorghum crop, not shown here, was somewhat backward last season owing to dry weather after sowing, and was expected to yield only 15 tons of fodder per acre, whereas, on previous occasions, 30 tons have been harvested. The crop from this field has been mixed with cow-pea and chaffed for ensilage, which process is shown in the illustration. Here horse-power is used, the same animals which cart the crop being used in the three-horse gear. The silo is constructed of reinforced cement, and will contain 60 tons of silage when full. The Biggenden climate appears to be well adapted to the cultivation of the sun-flower, judging by the large size attained by the Giant Russian Sun-flowers in the manager's hands—from 16 to 18 in. in diameter. There is a good market in Australia for sun-flower seeds, as for all other oil seeds, but prices for produce are too low to enable the white grower to successfully compete with cheap-labour countries. Sesamum, castor-oil, candle-nut, olive, linseed, cotton-seed, peanut, oil palm, and many other oil-producing plants thrive admirably in this State, but the cost of production prohibits production on a profitable commercial scale.

In the case of pea-nuts, candle nuts, oil palm nuts, and other hard-shelled nuts, the purchaser requires them to be shelled. There is, we understand, a machine for shelling oil palm seeds, but it is not favoured by the natives of West Africa. The shelling of candle-nuts by hand would effectually put them out of the market in Brisbane, where only £10 per ton can be obtained for them. Castor-oil beans are worth about £9 per ton.

The other photographs give a good general idea of the farm buildings and the manager's house.

---

### ROTATION OF CROPS.

All who are engaged in farming pursuits know what is meant by rotation of crops, but how many in this State practise is? One main reason for the neglect in making different crops follow each other in different years on the farm may be traced to the wonderful fertility of most of the arable land in farming districts. So rich are many of these soils that before a good crop of wheat can be raised from them, a series of crops of maize, potatoes, or roots must be taken off, otherwise coarse straw will be produced at the cost of the grain. On such soils oaten straw is often so thick and coarse as to be useless for hay-making, and when wheat is at last grown heavy crops have been harvested year after year for more than twenty years without the use of manure, or recourse being had to rotation. But, on many soils, rotation is very desirable. On these, if potatoes are made to follow potatoes year after year, the ground eventually becomes so infected with disease that only scabby tubers can be produced. It is the same with clover. After a time, unless



*Plate XVIII.*



MAIZE, TEN WEEKS OLD, BIGGENDEN STATE FARM.





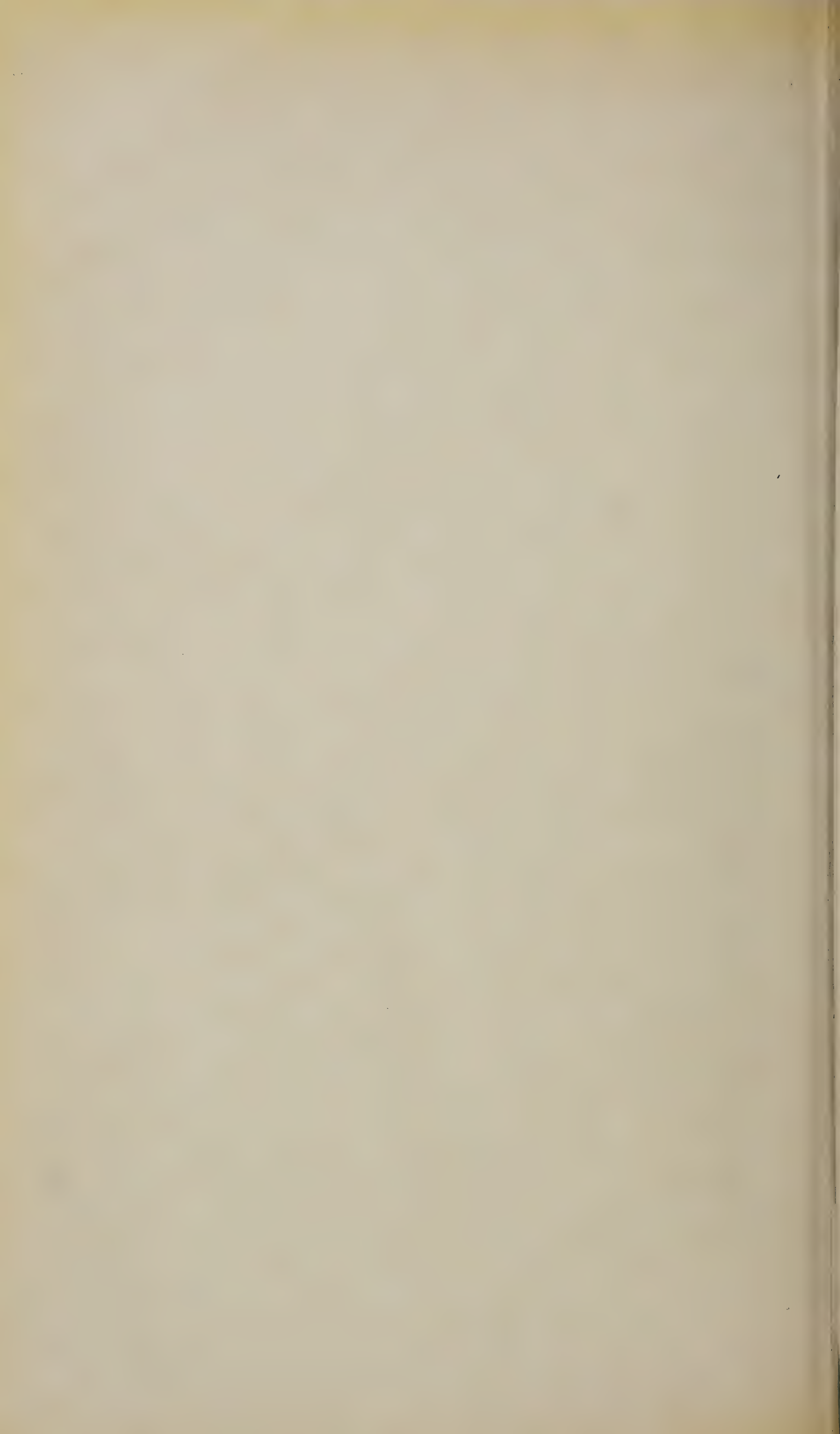


*Plate XIX.*



RED KAFIR CORN, FOUR MONTHS OLD, BIGGENDEN STATE FARM.



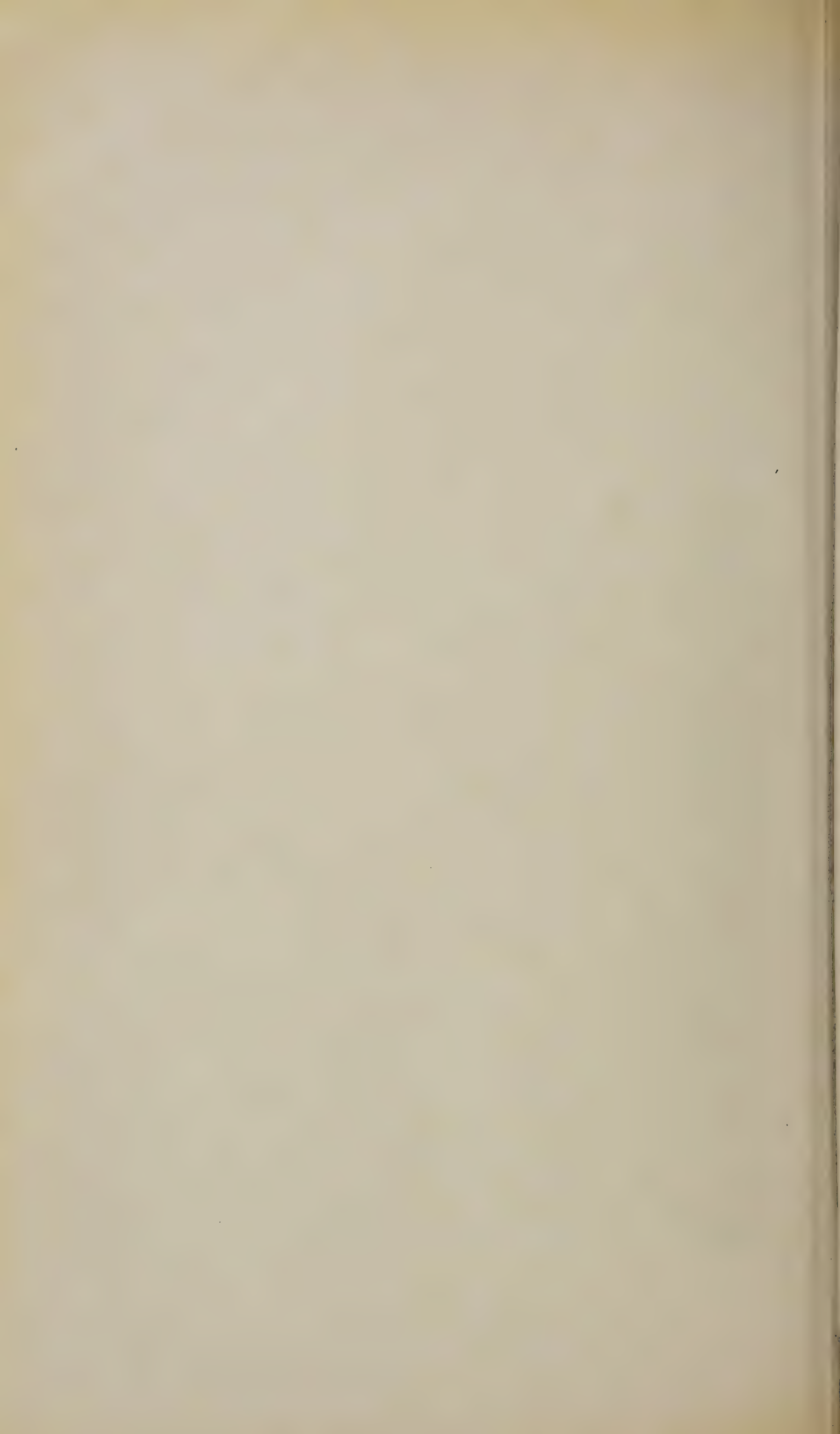


*Plate XX.*



CHAFFING COWPEA AND SORGHUM FOR SILAGE, BIGGENDEN STATE FARM.



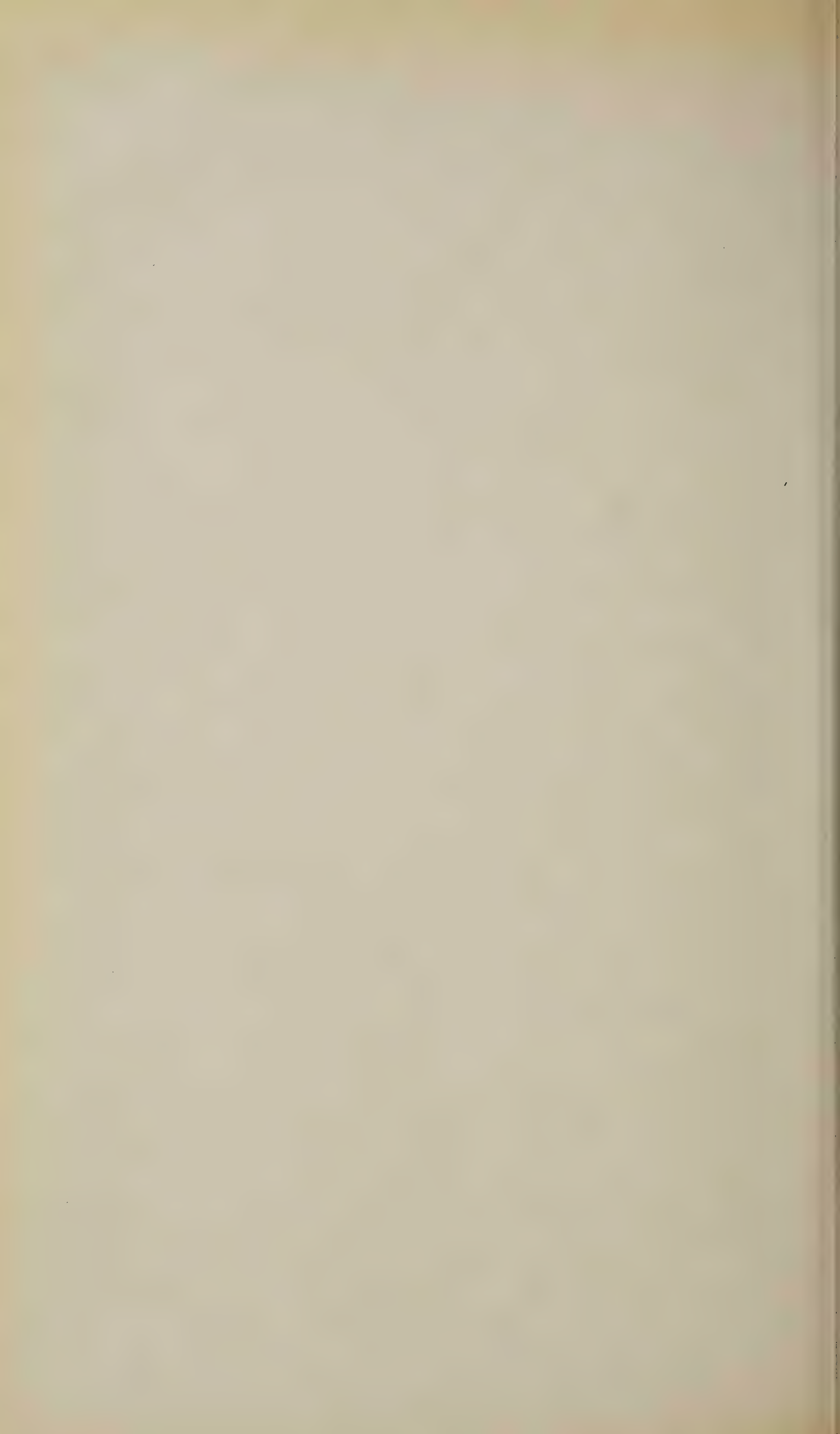


*Plate XXI.*



GIANT RUSSIAN SUN FLOWERS, BIGGENDEN STATE FARM.





*Plate XXII.*

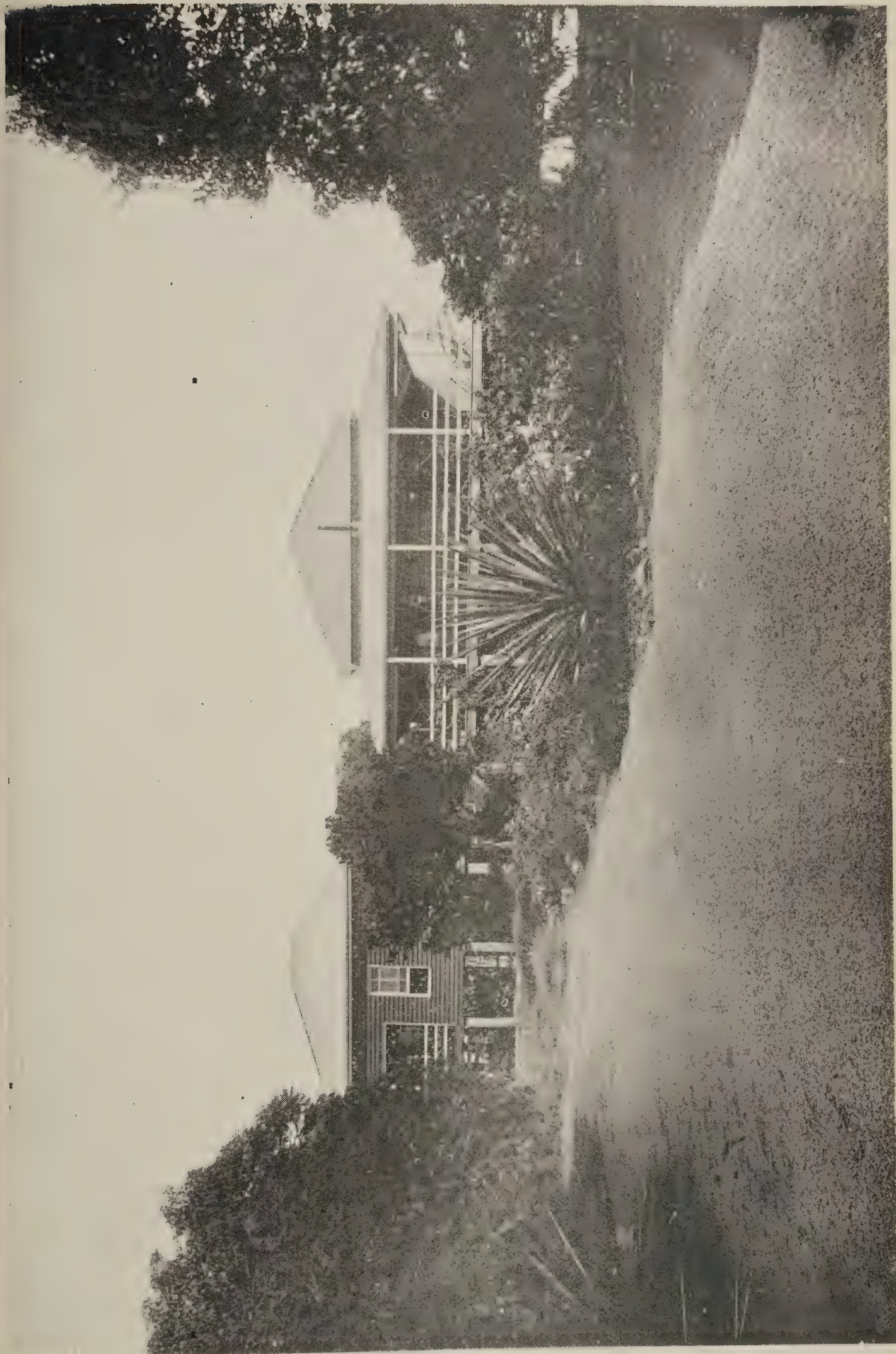


GENERAL VIEW OF THE BUILDINGS, BIGGENDEN STATE FARM.



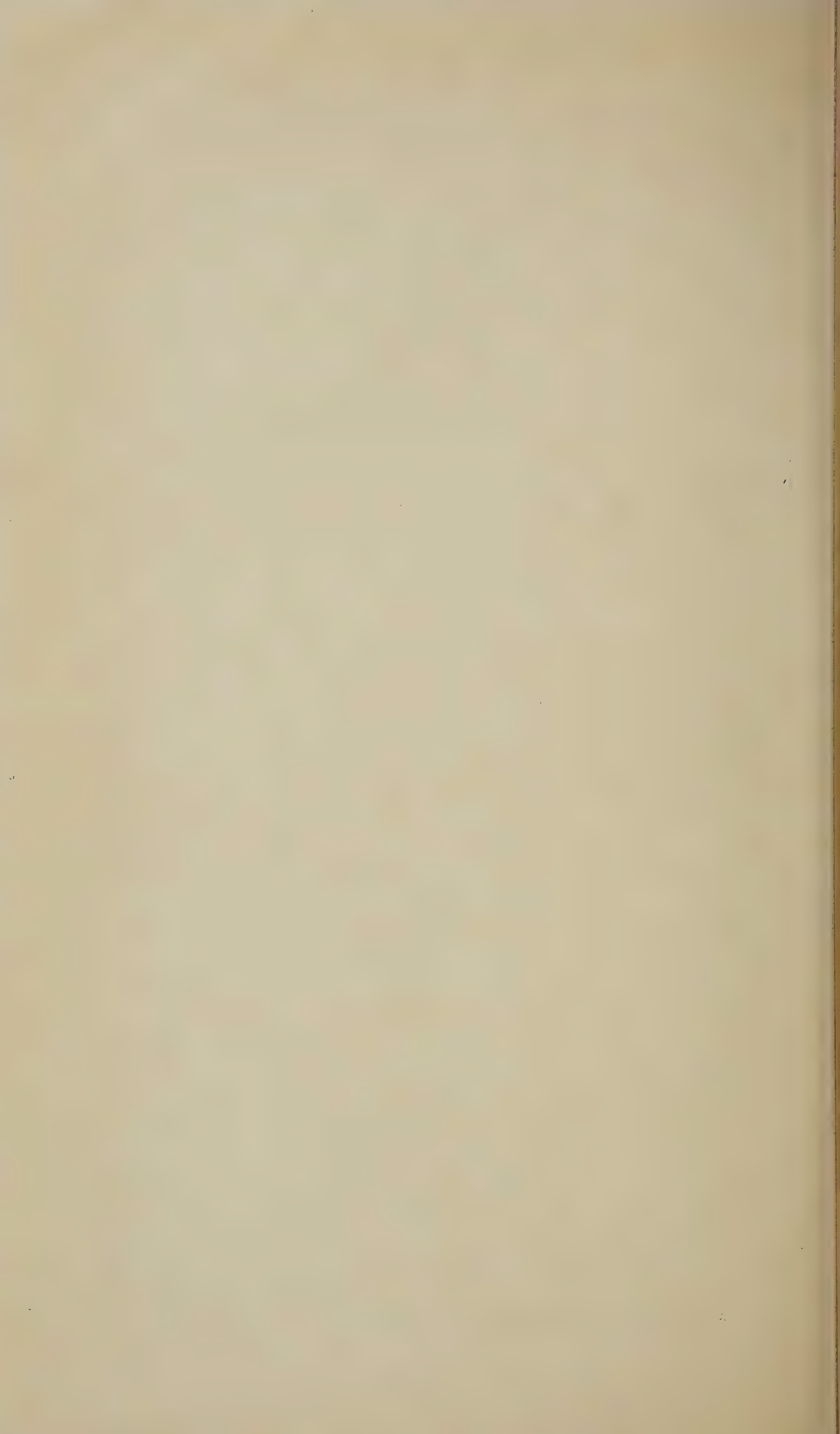


*Plate XXIII.*



THE MANAGER'S RESIDENCE, BIGGENDEN STATE FARM.





clover is preceded by, say, wheat, and succeeded by potatoes, and if the ground has been occupied by it year after year, the land becomes what is known as "clover-sick," and the crop fails. Land kept continually under cereals becomes foul with weeds. In the case of small fruits, such as strawberries, too long a continuance of the crop on the same ground results in the land being filled with insects. Then, it should be considered that many plants feed only in the shallow surface soil, leaving stores of food deeper in the ground untouched. In order to utilise these plant-foods in the deeper sources, deeper feeding crops must be planted. Furthermore, there are crops which gain their entire sustenance from the soil, whilst others, like the legumes, draw a portion of their food, in the shape of nitrogen, from the air. The former impoverish the soil, the latter enrich it. Again, different crops draw unequally on the different food elements of the soil. A crop of beans or peas, for instance, draws heavily on the potash and lime in the soil, whilst a crop of wheat requires relatively small amounts of lime and potash, but large amounts of phosphoric acid. The same soil will, therefore, more easily produce a large crop of beans or peas, and a large crop of wheat following each other, than if two successive crops of beans or two successive crops of peas were grown.

For all these reasons—the maintenance of soil fertility, the renovation of impoverished soils, the production of large crops, the destruction of insect and weed pests, and the more economical distribution of labour throughout the year, and hence greater profits—a proper system of rotation is considered essential to continued success in modern farming. The rich farming lands of the older countries of Europe have been maintained in fertility for over a thousand years by the help of rotation, fallowing, and manuring.

There are certain systems of crop rotation generally designated by the number of crops entering into them. Thus, we have the three-course rotation, into which three different crops enter, such as wheat, followed by clover, and the latter succeeded by potatoes, after which wheat may again be grown. A four-course rotation may also be employed, although the three-course is most common wherever rotation is practised. A good four-course rotation consists of wheat or rye followed by clover, then maize, to be followed by oats. As soon as the oats are harvested, the ground should be got ready for the next crop on the rotation. A five-course rotation would consist of maize, potatoes, rye, and clover, or two or three years of lucerne. Where cotton is grown, a good rotation is maize the first year, oats and cow-peas the second, and cotton the third year.

It should be observed, however, that the rotation to be followed on different farms will necessarily vary with the nature of the soil, the seasons, the markets, &c., so that no one hard-and-fast system can be given which will serve as a guide to all farms. Some of the general principles that should guide in laying out a systematic rotation are as follows:—

1. Have at least one leguminous crop in the rotation.
2. Have at least one cultivated crop.
3. Rotate shallow-rooting crops with deep-rooting crops.
4. On leachy soils, have a growing crop on the land all the time.
5. Avoid bare summer fallowing.
6. Do not rotate small cereals with other small cereals.
7. Plan the rotation so as to have about the same amount of forage every year.
8. Keep stock on the farm.
9. Unless the farmyard manure thus made—unless it be thoroughly rotted—to the rank-growing crop in the rotation, such as maize.



### FARMYARD MANURE.

The Board of Agriculture for Ireland has issued a useful leaflet on the production, management, and use of this manure. It is pointed out that—(1) It is produced in greater or less quantity on every holding. (2) By its use the manurial ingredients removed by crops consumed on the farm may be returned directly to the land. (3) It forms the basis of most systems of manuring. (4) It is suitable for application to practically every crop. (5) It has a most important influence on the physical condition of the soil.

*Composition of Dung.*—Dung is a complete manure—that is, it contains all the elements of plant food likely to be deficient in a soil—namely, nitrogen, phosphates, and potash. Although the quantities of these substances found in farmyard manure are small as compared with the amounts contained in artificial manures, this deficiency is in a large measure made good by the heavy dressings of dung it is customary to apply. Dung differs from artificial manures in several respects:—(1) The nitrogen, phosphates, and potash in it are present as much more complex compounds than they are in artificials, consequently the effect of a dressing of dung is spread over a longer period. (2) Farmyard manure has a beneficial influence on the physical condition of the soil. This effect, not obtained by the application of artificial manures, has an important bearing on soil fertility. Dressings of “long” dung render heavy retentive soils more friable and pervious to air and water, drainage is facilitated, and the land made easier to work. On light land, the application of well-rotted dung increases the retentive power of the soil for moisture and plant food. It is an important point in favour of dung that by its use the fertility of a soil can be maintained without the disadvantage of diminishing the stock of vegetable matter, such as occurs when artificials are used exclusively.

*Liquid and Solid Manures Compared.*—The liquid portion of farmyard manure is more valuable than the solid since it contains a greater proportion of nitrogen and potash, and, furthermore, the ingredients in it are in a more readily available and quicker acting form. Manure from which the liquid has been allowed to escape is much reduced in value, as most of the nitrogen and potash has been lost.

### CONDITIONS AFFECTING THE QUALITY OF FARMYARD MANURE.

Farmyard manure varies considerably in quality owing to the widely differing circumstances under which it is produced. The chief conditions which affect its quality are worthy of consideration, and will be briefly discussed.

*Kind of Food Used.*—The greater portion of the manurial ingredients contained in foods are voided in the liquid and solid excrement. The average proportion of the total of each of the manurial ingredients consumed in food which pass into the manure are estimated as:—Nitrogen, about 75 per cent.; phosphates and potash, about 90 per cent. respectively. Since the greater part of the manurial constituents of dung are derived from food, it is evident that the quality of the feeding stuffs used very largely influences the quality of the manure. Foods such as cotton cake, linseed cake, &c., rich in fertilising ingredients, produce good dung.

*Kind and Age of Animal.*—Young animals making rapid growth and cows in milk extract greater quantities of the valuable ingredients from food than do fattening animals or working horses, and consequently the manure derived from young animals and cows in milk is poorer in quality than that voided by fattening cattle or working horses. It is estimated that a cow in full milk will extract from food four or five times as much nitrogen, three or four times the amount of phosphates, and about ten times as much potash as a fattening bullock fed on a similar ration.

*Litter.*—Litter influences the character of farmyard manure in several respects. In the first place, the physical effects of dung, to which reference has already been made, depend mainly on the kind and amount of litter mixed



through the manure and its state of decomposition at the time of application. Bulky litter which is but slightly rotted has the greatest physical effect on stiff soils, whilst the reverse holds good in the case of light soils. The materials used as litter, of which straw and peat moss are in most general use, contribute in a small degree only to the chemical composition of the manure, and if used much in excess of the quantity required for absorbing the liquid the resulting product will be more bulky but less concentrated than where the amount of litter is restricted.

*Fresh and Rotted Manure.*—Even under the most favourable conditions an appreciable loss of nitrogen occurs during the storing of dung, but provided the manure has been so treated as to reduce waste to a minimum, the smaller bulk of rotted manure will contain most of the nitrogen and practically the whole of the other manurial ingredients originally present in the fresh material; furthermore, the ingredients in manure rotted under such conditions will be more readily available as plant food.

*Storage.*—The method of storing farmyard manure has great influence on the final quality of the dung. No matter how rich the solid and liquid excrement may be in the first instance, a large proportion of the valuable ingredients of the manure are liable to be lost by subsequent bad management. Whatever may be the conditions under which dung is made and stored, care should be taken to prevent—

1. Loss of the liquid by drainage, for the reasons already indicated.
2. Over-heating, which drives off much of the nitrogen from the manure.

The following precautions for preventing loss from farmyard manure in either of the two ways mentioned are applicable to all conditions under which dung is produced.

The manure from different classes of stock varies considerably in character and quality. Thus, horse manure is rich, dry, and in bulk quick to ferment and overheat. On the other hand, manure from byres and piggeries is less concentrated, contains more moisture, is cold, and ferments slowly. A manure evenly rotted and of uniform composition is secured by mixing the dung from each class of stock together. It is a bad practice to keep each kind of manure in separate parts of the dung heap.

The manure should be spread over as little space as possible, kept well compressed and moderately moist. In covered yards, where cattle or pigs are kept on the manure, these conditions are easily attained. Open heaps, however, require more attention, and the manure should be compressed by wheeling each barrow load of dung over that already in the heap.

The bottom of the heap should be covered with a layer of some absorbent material such as bog mould, rough litter, &c., and a quantity of such substances also kept round the heap to retain the liquid; this material should be thrown up on the heap as it becomes saturated, and then replaced by a fresh supply.

*Site of Manure Heap.*—The manure heap must necessarily be situated convenient to the farm buildings, and consequently the choice of a site is often restricted. The most favourable situation is on level ground where there is small chance of water gaining access to the heap from springs, higher ground, or roofs of buildings, or of the liquid draining away from the manure.

*Bottom of Manure Heap.*—The bottom of the heap must be impervious to liquids. Concrete or hard bricks laid on edge make excellent floors, which in addition to being water-tight afford a hard surface for carting. A layer 8 to 12 in. thick of well-consolidated clay makes a cheap and in many respects a suitable floor. The bottom of the heap should have a distinct slope backwards, especially when there is a retaining wall at the back against which the manure can be compactly built.



### AN AMERICAN'S ADDRESS TO FARMERS' BOYS.

It wasn't the schools and books and dairy papers that made those farmers in the cow census reports, who get less than a dollar's worth of milk for every dollar's worth of feed. It is not study, nor reading dairy papers and books, that makes such men. What does produce them? A lack of reading and study. They are not using their brains. They are not doing a thing to put sound knowledge in place of ignorance. They have never built up an ideal in their minds of a well-equipped, well-conducted dairy farm. They have never studied out the principles of dairy feeding as they are understood by the intelligent men in the business. When they were boys and young men, just as you are, they were not trained and encouraged by their fathers to make a deep, full study of this business called dairying. Their fathers never provided them with the means to improve their minds and take in useful knowledge, and so they came up with a low ideal of dairy work, of dairy farming, of breeding the dairy cow, and the care and feeding necessary to make her profitable.

This low standard of dairy farming is what is cursing them to-day. It is the thing that is holding them back. They don't see it, probably never will see it. "As the twig is bent so is the tree inclined." But you boys have the making of your future in your own hands.

Cultivate your minds by constant reading and thinking on farm questions. Don't follow in the starvation path these poor dairy farmers have travelled. Don't think that the less you read and study the more money you will make in farming, and the more you will be thought of among men. You are to be the farmers of the nation in the next twenty-five years. Remember that you cannot make a successful farmer with an ignorant mind.

If you have never been given a good education, don't be discouraged. You can educate yourselves by constant reading, thinking, and observation. Some of the brightest, finest farmers in the land to-day have arrived by that route. But be determined to build up a high standard of excellence in your minds concerning dairy farming. It is the character of your thinking that will make your labour valuable or not valuable to yourself and others.

Carry this thought with you always: Every day's work you do, every book and paper you read, every thought you think is making your education for you. It is these things that will lift you up or send you down. Be ambitious to make first-class farmers, the best in the land, of yourselves; to have the best-tilled fields, the cleanest stables, the best cows. It is a splendid ambition for any man to have. Then remember that the better farmer you are, the better citizen you will make. The bigger man you are inside your line fences, the greater you will be outside of them.

---

### LETTUCE RUNNING TO SEED.

During the late hot weather it has been difficult to grow good cabbage-hearted lettuce, owing to its tendency in the height of summer to run to seed. A contemporary says that although this mishap cannot be wholly prevented, everyone may, by following the practice here given, bring about an essential improvement in his stock. The chief condition is to cultivate only such varieties as are found to succeed in the district. When the plant begins to form hearts, the finest of these should be marked throughout the bed, and as soon as these marked plants begin to shoot they should be pulled up for use, and this practice is to be persisted in till only so many plants remain in the bed as will suffice for affording a crop of seed. By this process of selection, carried on for some years, plants may be raised which will fully resist the effects of hot weather.

### PREVENTING WASTE OF SILAGE.

Each year, as frequently as silos are filled, there is considerable waste, owing to the surface layer coming in contact with the air. The loss varies with the condition of the corn, and with the attention it has received after it is placed in the silo. In seasons of plenty it is a common practice to simply fill the silo and take chances on what would spoil. This is a very wasteful practice. It is possible to bring this waste down to a minimum by a little attention after the silo has been filled and thoroughly tramped.

Last year, owing to the scarcity of corn, we made an extra effort to preserve all that we had. As a result of which effort there was scarcely 2 in. of spoiled silage. After the silo was filled and thoroughly tramped we put a 2-in. layer of clover chaff on it. We then dampened this chaff with a barrel of water in which had been dissolved a 10-quart pail of salt. This brine proved to be the most effective preserver we had ever tried. On the surface, when we came to feed the silage, the 2-in. layer on top peeled off slick and clean, and left good silage immediately underneath. Try this scheme on your silo, and you will save much fodder that would otherwise be spoiled.—  
“Canadian Dairyman.”

---

### PRACTICAL INSTRUCTION IN JUDGING STOCK.

During the last two years young men have been encouraged by the Queensland National Association to take a hand in judging stock at the annual show under the guidance of the regular judges. The experiment has proved very interesting and successful, and will go a long way towards rearing the judges of the future. From the “Mark Lane Express” we learn that the same course is being pursued by the committee of the Shaftesbury Farmers’ Club in England.

Theirs was one of the first clubs to introduce the system of judging stock in the show ring by young men prior to the animals coming before the appointed judge. So popular has this innovation become that several other societies have been and are taking up the same course of instruction; moreover, the officials of the County Council Education Committee are receiving the system favourably and encouragingly, looking upon it as a proper channel for imparting instruction in rural districts. It can be confidently said that in the near future this procedure will be greatly in vogue, as we know of no better method of training our young men in the methods of observation; and, in addition, the competition emulates them to take a keen interest in all classes of stock. It is hoped that arrangements may be made for the society’s judge or judges to give a demonstration, pointing out the essential and more important points of the animal.

The above-mentioned practical training is followed by a winter course of instruction in the scientific principles underlying the study and practice of agriculture.

---

### COTTON-GROWING.

By DANIEL JONES.

#### GATHERING AND PREPARATION.

Much misapprehension exists relative to the method of picking cotton in our State.

Very much has been said of the great necessity for care in this process to avoid unduly gathering leaf and other *débris* along with the fibre; also on the need for drying and separating stained and immature fibre.

Too much emphasis has all along been laid on these precautions, resulting in valuable time being lost.

That ordinary care must be observed, in justice to the buyer, needs no reiteration, nevertheless the trader’s interests, along with the producer’s, are not advanced by methods which in themselves are not called for, and in the end serve to add largely to the cost of production.



For some years past it has been my object to lay before growers the importance of economically handling this crop so as better to meet local labour conditions, and generally expedite the picking operations. The cultural methods in vogue in Queensland, for the most part, call for little attention, the cotton crop requiring little, if any, more tillage or experience than what is demanded for ordinary field crops.

In the picking, however, we are lamentably lacking in that celerity common to the American cotton-grower. It will best serve my purpose to give, in as brief a manner as possible, the manner in which the farmer in the United State handles his great crop.

The American planter to-day, by reason of labour conditions, has little or no advantage over the Queensland grower. The day of abundance of negro field labour is now a matter of history; the negro, although once largely in evidence as a help in the cotton fields, has now, by reason of his advanced education, drifted into other, and, to him, more congenial fields of activity than that of the ordinary farm hand.

So it happens that a large percentage of American farms have no coloured or cheap labour whatever employed. Thus Queensland farmers are under no disability in the matter of low-priced labour. The secret of American superiority lies in the fact that their simple and methodical handling of the crop gives them a very material advantage.

In Queensland a picker, if, at the end of a day's toil he has gathered 100 lb. of fibre in the seed, it is regarded as a good evidence of brisk effort, while an increase of 20 to 30 lb. constitutes a record, working on Upland varieties. With the American this quantity represents a very poor day's work, three and even four times this amount being frequently gathered for periods of time.

The Washington Department of Agriculture makes the official statement "that first-class pickers can pick, by hand, an average of 500 to 600 lb. of seed cotton per day, and as much as 800 lb. occasionally. A white hand was timed in 1894, and he picked 60 lb. in an hour, or 1 lb. per minute." This, of course, is not possible unless there is a good blow of cotton out, and in the process a more than ordinary amount of leaf-trash is collected with the fibre.

As evidence in substantiation of the claim here made on behalf of the American picker, I may give my personal experience at Capella, in Central Queensland, in June last, on the farm of Mr. Willis Hargrove, an American grower recently settled in that locality, and who is chiefly engaged in this vocation, beginning in a small way with a few acres. Mr. Hargrove then, had employed a young American, a Mr. Rowan, who has since gone into cotton-growing on his own account, and, at the present time, has 30 acres looking well and nearly ready for harvesting, in the same district. This person elected to prove that American claims were genuine, and, in my presence, in two hours he gathered 58 lb. cotton, 27 lb. in the first hour, and 31 in the second, which, at the price of  $\frac{1}{2}$ d. per lb. for picking (the rate allowed) shows his earnings to be a fraction under 1s. 3d. per hour. It may be said this was an exceptional spurt, but as it was done in but a half-crop of cotton, it is easy to realise that an average of 250 to 300 lb. a day would be no extraordinary result for an active experienced picker.

In handling such cotton as Sea Island, Egyptian, Mascotte, or Caravonica varieties, equally good results will not be attained, by reason of the character of the cotton bolls, which are not free in parting with the fibre, and not as large in pod.

The person here referred to claimed to have picked, in the States, 500 lb. a day on many occasions. To enable this to be done, very expert handling must be acquired, especially the ability to gather equally as well with the left as with the right hand, using both simultaneously. This training is acquired by degrees, and it is always impressed on the young picker that



both hands must be trained to acquire the ability to pull the fibre with equal facility. This once mastered, solves the problem of economically and profitably handling a large cotton crop, without which the Americans would often lose a large portion of their annual 14,000,000-bale harvest, and ensures for the pickers, even at a much lower scale of payment than our growers are satisfied to pay, a fair remuneration for his service.

To enable the picker to best carry on his work without impediment, the Americans use a different picking bag to ours, being in every way much easier on the pickers. It is made of strong calico, and is about 7 or 8 ft. long, with shoulder straps made so as to allow the bag to swing on the left side, and, for the most part, trailing on the ground behind the picker. This bag is thus constructed to permit the free use of both hands, and avoid loading the picker with the weight of fibre gathered which lies in the bag trailing behind him. This bag when full is emptied on a sheet placed in a convenient position in the field, and is usually all the drying the cotton gets. Of course, no cotton is gathered under wet weather conditions. Should rain take place before the cotton is placed under cover, then a further drying process is imperative.

It must be expected that cotton so rapidly picked is not as free from leaf and dirt as in the case of the slower process; nevertheless, the American buyer is content to have his article in this form, and no diminution of value ensues as the result of a little foreign matter in the fibre, which is practically unavoidable under the circumstances.

In Queensland we have erred too much in our method of picking and drying of this crop. My remarks here refer only to the Upland and low-priced fibres. Such high-quality cotton as Sea Island must have very much more care taken in its picking and preparation for market. Upland cotton then, is easy to gather, particularly if the pickers do not enter the field to look for cotton. Too often our growers start their hands into the field, and, after rambling about all over the rows, they have little to show for their time. This practice is often indulged in by those unfamiliar with the pursuit, who have lent the ear to needless warnings of danger from over-exposure to weather, wet or dry.

My local experience is that the weather rarely injures a cotton crop when fit for gathering. Cotton, if well opened, will stand heavy rain with little injury. It is when the pods are partly opened, and lodgement is found for the wet, that the greater damage is inflicted. However, this is a misfortune not often experienced here, the reverse being too often the case, since the absence of rain is a more dreaded feature of agrarian interests than surplus moisture, which may, in any serious degree, menace a cotton crop.

Stained cotton also is sometimes referred to as an undesirable feature of the crop, and too much has been said about the liability of the Queensland crop to this risk. Rarely, if ever, does the cotton come to hand in commercial quantities where this objection can be raised. Cotton which is stained is seldom gathered, nor does it pay the picker to trouble with any cotton but the clean, ripe, and well-opened. Stained cotton, unless the discolouration be due to the depredations of beetles, is rarely seen in Queensland, is usually due to weather or boll worm attack, and, so far, in very limited quantity, hence it is never considered profitable to bother with any fibre but that which is of first quality. This simplifies and accelerates very much the operation of gathering. Last season's cotton was gathered in satisfactory condition after three months' exposure to the weather, no reduction in value being enforced on the grower. This disproves the idea expressed by those unacquainted with cotton that it is too tender in its nature to stand long exposure without detriment to its value. Here, with our dry warm Summer and Autumn weather, when the cotton opens out, the conditions for successful harvesting are ideal ones, no other cotton country having any conditions superior to ours in this respect, save perhaps Egypt, where rain rarely falls, and the crops cannot be produced otherwise than by an expensive system of irrigation.



In pointing out, as here stated, the most economical methods of picking cotton, it will, I trust, be understood that in no sense is it laid down that the crop can just be hustled in without any care or supervision. It is not judicious nor safe to neglect ordinary precautions in preparing the fibre in good order and condition, for this, in justice to the buyers, must be attended to. Hitherto we have undoubtedly erred on the other side, and in our extreme anxiety to have our article in top condition, we have materially and unnecessarily increased the cost of production. The American has no such scruples, and thus is enabled to handle his 200 to 300 lb. of cotton per hand with ease. Again, his field operations are also much less extended than ours, whereby he saves labour at points where our methods are superfluous.

Briefly stated, in the United States, the planter sends his hands into the field when the blow is good—no looking for fibre. The pickers gather with their usual speed, the picking bag, as heretofore described, is emptied on to a large sheet, which is about all the drying the cotton receives. This remains on the sheet until noon or till the day's work is over. The four corners of the sheet are then drawn together, and the cotton therein carried to the wagon located in the field ready for it. Often the fibre is carried direct from the pickers' bags to the wagon. It is here weighed and loaded. When the wagon is transferred and filled, the mules are hitched in, and the team pulls the vehicle to the ginnery, located in the most central position convenient to the general body of planters.

On arrival at the ginnery the load is placed on a weighbridge and recorded.

Subsequently a suction tube, operated by a fan, is lowered into the wagon and the contents are rapidly drawn into the battery of gins operating in the building. The lint and seed are separated, the seed dropping into sacks for transport, the lint falling into the hydraulic presses. Thus, scarcely a hand has touched the fibre since the picker placed the article in his bag.

This is how the up-to-date Yankee now handles his huge cotton crop and makes a living under much greater difficulties than the Queensland grower has to contend against.

American land is dearer than ours; it invariably must be fertilised with costly manures; the yield per acre does not, on the average, come up to the Queensland yield; insect troubles are greater; the quality of lint is not so good as ours.

This is admitted by the British Cotton Growers' Association, who have repeatedly stated our fibre to be worth 1d. per lb. over average American.

If our motto now is as it once was: "Advance Australia," it then becomes the duty of all to recognise the potentialities of this vocation. So far as our limited plantings have shown during the past few years, cotton has given better returns to farmers than most farm crops.

Economy in handling as here outlined will do much to popularise this pursuit if the country is to become an agricultural State.

The outlook in this direction is not too promising; with the heavy decline reported in agriculture last year, totalling, as per report of Department of Agriculture, 30,000 acres, it looks as though this State is to be noted for little else than its mineral, grazing, and dairying activities. These, in themselves, are very important, but are not the interests which best promote close and permanent settlement, just as important? A cotton planter with little capital, under ordinary conditions, can make sure of a good living on 30 acres of crop, usually returning from £6 to £9 or over per acre. He gets from 1 acre quite as much as a dairyman does from one cow, with much less risk and attention and deprivation of home comforts. One point I wish to emphasise is this—that the so-much-talked-of interference with the children's education as the sequence of cotton cultivation stands without point. Most farm pursuits engage the little ones, but I know none, save sugar, which offers the same opportunity of satisfying the adult in point of remuneration as this crop does.



If the American can gather—and he undoubtedly does gather—the amounts credited to him, we need no juvenile or cheap labour. An active adult trained to the work, which is quickly acquired, earning his 6s. or 7s. a day in a light, healthy, open-air pursuit, should have no ambition to seek the unhealthy, cramped occupations of the factory.

As a change of vocation for our male and female factory operatives, this work should be very popular, for not only would the earning be superior to the city vocation, but the cost of living would be much cheaper, and the work calling for little skill or strength, would be within reach of many who, under present conditions, are either or nearly on the verge of becoming unemployable.

The season's crop is now nearly ready in some districts for gathering, and it will be well for growers to study the system outlined for the cheaper handling of the crop. Farmers in dry weather can safely transfer such cotton as is free from wet or dew and fully ripe, direct from the picking bags to the bale, which will be economy in handling and economy of space and room.

---

#### A NEW DOUBLE-HEADED WHEAT.

A South Australian paper reports that an engine-driver, Mr. J. J. O'Shea, at Eudunda, last year noticed amongst a wheat crop a plant bearing two heads on each stalk. Anticipating a new wheat, Mr. O'Shea carefully collected every grain, with a view of testing his find. The grain thus got weighed  $5\frac{1}{4}$  oz. Mr. O'Shea, so as to make a thorough test of the wheat, put the experiment in the hands of Messrs. Dermody Bros. The grain was sown between a drilled strip of Marshall's No. 3 and Bluey, no grain being sown in the centre strip by drill. The new wheat was hand sown afterwards, about the same distance apart as that sown by the drill.

The result eclipsed all expectations. On an average the Marshall's and Bluey varieties produced eight stalks for every grain sown, and the new variety had sixteen to every grain sown; while, more remarkable still, the plant which last year produced two heads, this year had in some instances as many as seven heads. These heads are very distinct, and easily counted. The centre head is in appearance like any bearded variety, while the additional heads grow out of two sides of the centre head, the largest being towards the butt of the stem, gradually diminishing in size towards the end of the head. The actual amount of wheat gathered from the  $5\frac{1}{4}$  oz. sown is  $59\frac{1}{2}$  lb. This works out at 90 bushels per acre, taking the quantity sown per acre as being about half a bushel, on which basis it was sown. Mr. O'Shea showed his wheat to several of the leading wheat-buyers and farmers of the district, but the variety was new to all of them. A difference of opinion exists as to the original formation of the variety. Some think that it was brought here in imported manures, as it was not unlike a variety of Egyptian wheat, whilst others hold the opinion that it is a new wheat formed through natural hybridisation. In order to prove the value of his find, Mr. O'Shea is keeping the whole of his gathered grain, proposing this year to sow the quantity on 2 acres of land.

---

#### ANOTHER NEW CLOVER.

A new forage crop, the Clover Moellier, is described in the "Journal of the Victorian Department of Agriculture." It grows 4 ft. to 5 ft. in height, and yields a great quantity of succulent foliage, which may be cut off five times in a season, or, as the stems are fleshy, the whole plants may be chaffed for animals. All kinds of stock eat it eagerly, and it is said to be highly nutritious. It withstands drought and frost alike. In a trial of the plant carried out by the official Dairy Supervisor, the weight of the first cutting of leaves was estimated at 4 tons per acre. The labour of cutting off the leaves and carrying them off the cropped land must be a great objection, except perhaps to occupiers of small holdings.



## Dairying.

### THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

#### RECORD OF COWS FOR MONTH OF JANUARY, 1909.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Dot ...	Shorthorn ...	12 Nov. 1908	1,023	4.0	45.76	
2	Gem ...	Grade Shorthorn	13 Dec. "	868	4.2	40.83	
3	Whitefoot ...	Holstein-Devon	20 Oct. "	899	4.0	40.18	
4	No. 112 ...	Grade Guernsey	24 Nov. "	899	4.0	40.18	
5	Orange ...	Guernsey ...	23 Oct. "	651	5.4	39.32	
6	Bee ...	Jersey ...	9 Dec. "	589	5.5	36.28	
7	Graceful ...	Grade Shorthorn	10 Dec. "	620	5.0	35.00	
8	Conceit ...	Ayrshire ...	22 Dec. "	826	3.9	34.95	
9	Careless ...	Jersey ...	7 Dec. "	775	4.0	34.63	
10	Dora ...	Shorthorn ...	18 Nov. "	744	4.0	33.24	
11	Peewee ...	Holstein-Sh'rth'm	20 May "	696	4.1	31.91	
12	Laura ...	Ayrshire ...	16 Nov. "	790	3.5	30.66	
13	Poppy ...	Grade Guernsey	10 Jan., 1909	868	3.2	30.62	
14	Lowla ...	Ayrshire ...	8 Dec., 1908	773	3.3	28.17	
15	Len ...	" ...	6 May "	682	3.7	28.07	
16	Daisy ...	Holstein ...	24 Oct. "	813	3.1	27.73	
17	Comet ...	Grade Holstein...	20 Nov. "	690	3.6	27.60	
18	No. 1 ...	Shorthorn ...	1 Nov. "	744	3.3	27.11	
19	Sue ...	Grade Holstein ..	25 May "	604	4.0	26.99	
20	Nita ...	Shorthorn ...	23 Nov. "	713	3.4	26.83	First calf]
21	Dewdrop ...	Holstein ..	11 Nov. "	713	3.4	26.83	
22	Night ...	Grade Holstein...	5 Oct. "	713	3.4	26.83	
23	Mona ...	" " ...	20 Oct., 1907	620	3.8	26.25	
24	Wonder ...	" Shorthorn	2 Dec., 1908?	705	3.3	25.80	
25	Nancy ...	" " ...	7 May "	565	4.0	25.25	First calf
26	Ethel ...	" Holstein...	3 Sept. "	631	3.6	25.24	
27	Lady Loch	Ayrshire ...	24 June "	495	4.5	25.03	First calf
28	Remit ...	Holstein ...	5 Aug. "	620	3.5	24.06	
29	Carrie ...	Jersey ...	16 Jan. "	468	4.5	23.66	
30	Cocoa ...	" ...	20 Nov., 1907	519	4.0	23.19	
31	Lalla ...	Grade Holstein...	28 July, 1908	505	4.0	22.57	First calf
32	Eve ...	Jersey ...	16 Oct. "	527	3.8	22.30	
33	Burton's Fancy	Shorthorn ...	7 Sept. "	400	4.6	20.70	First calf
34	Grace ...	" ...	30 May "	579	3.2	20.42	
35	Stranger ...	" ...	" "	508	3.5	19.72	
36	No. 223 ...	Ayrshire...	1 Dec., 1908	540	3.3	19.68	First calf

Cows fed on natural grasses.

#### CHOOSING A DAIRY BULL.

That the bull is at least half or three parts of the future herd is an axiom which is unanswerable, and it is not only necessary to use a thoroughbred bull but to know his ancestors for three or four, or even five, generations past. It is not sufficient to know what his dam is. Succeeding generations of his dam may show improvement, but not from her own qualities alone. It comes from her inheritance, and that inheritance will very often in the bull come from three or four generations back. As to the breed of bull, this depends very much on the character of the country. For instance, it is no use putting Jerseys on swampy country, and at the same time it is of no use putting large-bodied shorthorns on to pasturages where there is not enough grass to

feed them, for when you have large-framed beasts you must have plenty of herbage. Each dairyman must decide on the class of cattle best suited to his own circumstances. A common mistake with dairymen is to change their breed. If the land is most suitable for Jerseys, get a bull of the best Jersey strain. On the other hand, if the land is low and swampy, Ayrshires will generally be found the most useful, and whatever breed is chosen stick to it, unless, of course, the results turn out unsatisfactory. There are many who prefer the milking shorthorn, and where there is plenty of rich pasturage this breed may pay best, as the steers can be fattened off and add greatly to the profit of the herd. The dairyman, however, with a small herd and a limited area of land will do well to stick to one of the two "dairy breeds," and so, whatever may be the breed of his cows, he may by using pure-bred bulls, and always of the same strain, appreciably improve his herd, and with the continued use of pure-bred bulls on the heifers thus bred it will certainly be astonishing if a first-rate dairy herd is not collected in the course of a few years. There is another phase of the subject which is worthy of attention, and that is in-breeding. This practice has been too long and persistently tried by the best breeders the world ever saw to need much argument, as all the best cattle in England and America are a result of this way of breeding to intensify and perpetuate the desired qualities in the offspring. It is well within the reach of every dairyman to grow and develop choice grades that for all practical purposes would be as good as the thoroughbred animal from which the cross was instituted, and maintain a high standard in his dairy by the careful selecting and mating of his breeding animals. There are two axioms that should always be remembered: Cull out all the indifferent milkers, of whatever breed they may be, and keep for breeding only those heifers whose dams were remarkable for their milk and cream production.

---

#### CURING HAMS AND BACON.

Before being killed, a pig should have nothing to eat for at least twelve hours preceding the slaughter. By whatever means the animal's death is accomplished, every endeavour must be made to get the last drop of blood out of the body, otherwise the flesh will not cure well. As soon as this is done, the carcass should be plunged into almost boiling water. The proper temperature is very important. If either too hot or too cold, the hair will not come freely off. A good old-fashioned plan to try the temperature is to let a few drops of pig's blood fall on the water. If it spreads all over the surface, the temperature is right. Leave the pig in the water till the hair comes freely off. The next thing is to hoist the carcass out of the water. Hang it up and scrape it vigorously with some sort of blunt scraper; the lid of a billy is as good as anything else. When the hair is removed, dry the carcass well. Next, remove the intestines, and wipe the inside of the body dry. Let the pig hang in a cool place for twenty-four hours. Then cut it up into hams, hands, spare-ribs, loins, and belly pieces. The spare-ribs and loins are usually roasted fresh. The other parts are rubbed over with coarse salt and a little saltpetre, and laid on a table, flesh uppermost, so as to drain off any blood.

Where a side is to be dry-cured whole, after removing the joint oil and washing the cavity freely with salt and water, the flesh part of the side should be sprinkled freely with equal parts of powdered saltpetre and boric acid, to retain the colour. After twenty-four hours wash this mixture off. Then dry-salt with the following:—50 lb. best fine dairy salt, 5 lb. of brown sugar, 5 lb. of powdered saltpetre, 5 lb. of boric acid.

These should be well mixed and passed through a fine sieve. Rub the flesh freely every morning with this mixture for fourteen days. Each day



drain off all accumulated fluids. More care should be directed to rubbing the first two days, after which it may be conducted more lightly. The sides are laid one on each other, and reversed every day.

When the curing is completed, wash off the salt, &c., with warm water, and hang the side up to dry in a well-ventilated room. With favourable weather this will take from four to six days.

The bacon is then hung in the smoke-house. The fire-place is outside the smoke-house, from which a flue communicates with the centre of the floor, to reduce the temperature of the smoke as much as possible before reaching the bacon. It is a distinct advantage to smoke in a cool state. Native apple-tree and hardwood sawdust, or damp maize cobs, are useful to smoke with, and will improve the flavour. The smoking will take from four to five days. Judgment is needed to determine when the flavour is sufficiently developed.

---

### THE BEST PORK-PRODUCING RATION.

Wiltshire is an English county famous for its pigs and pig products. Determined to arrive at finality in the matter of the most profitable feed for pigs, the Wiltshire County Council spent £250 on making exhaustive experiments, and at last came to the conclusion that the best pork-producing ration in the world is:—"One gallon of skim milk or butter-milk per day, 3 lb. of potatoes, and barley meal to make up the day's ration."

On this feed, says "Australian Field," pigs, weighing from 80 to 100 lb. each, made a weekly gain of 15 lb. Compared with a feeding ration of all barley meal, the feed gave a result of as 1,000 to 500—that is to say, it was twice as good. The potatoes should always be boiled, and no rotten ones should on any account be fed to pigs. Take a little trouble, and cut and wash them. Make the milk go as far as possible, and remember that if you are giving your pigs 2 gallons of milk a day, you are wasting 1 gallon.

---

### A NEW CASEIN TEST.

When visiting the Wisconsin Experiment Station, the Dairy Commissioner, Mr. D. Cuddie, met the two scientists attached to this station—Professor Babcock (the inventor of the great butter-fat test which bears his name) and Dr. Hart—and was privileged in being given a demonstration by these investigators of a test designed by the latter for ascertaining the amount of casein in milk. Mr. Cuddie was so struck by the value of the next test—its efficacy and simplicity—that he has secured one for the Department. The tester is constructed very much after the style of Dr. Babcock's machine, with the essential difference that the test bottles are reversed, the measuring neck being thrown outwards, for the reason that the casein being the heavier material in the milk is driven away from the centre by the centrifugal force. The materials used to separate the casein are acetic acid and chloroform. The test can be made by a boy. The extent of its utility has yet to be demonstrated, but it will probably prove of considerable value in connection with cheesemaking. Mr. Cuddie is now conducting an experiment to discover the casein contents of milks of varying butter-fat percentages, and thus provide a guide as to their relative value from a cheese-making point of view.—N.Z. "Town and Country Life."

---

## The Horse.

### SOUND STALLIONS.

Every horse-breeder will agree that it is desirable to breed from sound horses and mares. There are, however, unfortunately many so-called breeders to whom cheapness is everything, and the result is, that numbers of young stock are the progeny of unsound or weedy stallions, whose service can be obtained for one-half, of even for one-fifth, of the fee charged by the owner of a first-class, thoroughly sound sire. Why people are so blind to their own interests is inconceivable. A low-class colt or filly is more troublesome, and costs more to feed, than a really well-bred one, and the price obtained for either as a two or three year old is small in comparison with what would be paid for the better-class animal. It is truly a penny-wise, pound foolish course of proceeding.

The "American Cultivator," referring to the question, states:—The stallion should be pure-bred, recorded, certified to as regard breeding, and an excellent individual. It is of as great importance that he should be free from all forms of unsoundness or disease that are hereditary, transmissible, or communicable to offspring. It is equally as important and necessary that the mares bred to him should be sound in the same way, and not until both mares and stallions used for breeding purposes are free from unsoundness, such as we have indicated, can we confidently hope to raise the average excellence of our horse product to the high plane possible as the result of intelligent breeding and development. Many imported and home-bred stallions are unsound, and transmit to their progeny the predisposition to like unsoundness. This equally is true of the mares used for breeding purposes throughout the State, for many farmers have fallen into the grievous error of considering any broken-down, halt, maimed, blind, or otherwise unsound mare fit for breeding purposes, when no longer able to work in harness. Every breeder should have a clear understanding of the diseases and unsoundnesses that may correctly be deemed hereditary and transmissible, either in fact or as a predisposition. On general principles it may be confidently stated that blemishes and deformities due to accidental causes are not hereditary or transmissible, and do not, therefore, render the individual animal unfit for breeding purposes. In this category may be set down unsightly scars from barb-wire injuries, or similar accidental causes; blindness, due to accident; lameness, due to injury; united fractures, not implicating the pelvis causes, apart from disease, unfitting animals for labour. The greatest possible care must, however, be exercised in deciding these matters; and, where possible, it is much the better policy to select for breeding purposes animals in the best of health and free from every form of blemish or unsoundness, on the principle that breeding material should be of the best procurable character and quality.

---

### BROKEN BONES OF HORSES.

A popular notion exists that broken bones in the horse do not mend readily (writes New Zealand "Town and Country Life"), and that a fractured leg-bone constitutes a hopeless case, consequently the animal is consigned to the knacker or destroyed. Horses are often consigned to destruction for a broken leg—no matter even if it be a simple fracture which could easily be placed in a state for speedy repair, and no matter how valuable the animals



may be—because of this often mistaken notion that attempts at a cure are futile. It should be known that the bones of a horse unite, when fractured, more readily than do those of a man, and that some skill and a little care and patience will in many cases be rewarded with an excellent recovery, and the animals made as useful as ever. Even in bad fractures of certain bones of the limbs recovery will take place, and, though the horse may not be absolutely free from lameness afterwards, yet in the case of a valuable stallion or mare this is not of so much importance, as the animal can be well utilised for breeding purposes. The indiscriminate use of the pole-axe or the bullet is a most regrettable blunder in many cases.

## Statistics.

### COMMONWEALTH METEOROLOGY.

#### RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1908.												1909.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
<i>North.</i>													
Bowen ... ..	10·14	5·63	9·46	3·73	0·99	0·45	0·88	0·51	0·96	2·47	0·42	0·42	15·48
Cairns ... ..	27·02	8·03	20·60	5·99	3·05	0·59	3·70	2·12	0·74	3·07	1·60	1·41	32·05
Geraldton ... ..	44·39	13·27	39·00	14·23	18·52	2·64	8·11	3·66	2·81	6·93	3·80	1·69	47·92
Gindie State Farm ...	0·20	7·17	6·25	0·02	0·112	...	0·40	1·27	...	...	...	...	...
Herberton ... ..	9·29	5·02	8·92	1·40	0·38	0·31	2·36	Nil	0·51	1·27	0·61	0·78	12·41
Hughenden ... ..	0·98	5·18	6·91	0·30	Nil	0·05	0·68	Nil	Nil	1·67	1·94	1·05	7·55
Kamerunga State Nurs.	...	7·47	25·75	4·60	3·363	0·76	4·85	1·58	...	3·64	1·69	...	...
Mackay ... ..	9·28	3·83	17·43	14·82	3·25	1·29	1·65	0·71	2·27	1·80	2·57	0·2	15·00
Rockhampton ... ..	3·84	9·64	9·77	2·62	0·85	0·10	1·08	0·84	0·20	2·14	2·47	1·37	9·01
Townsville ... ..	12·21	6·69	9·03	0·38	2·22	Nil	1·70	0·27	0·28	1·58	1·26	0·7	6·94
<i>South.</i>													
Biggenden State Farm	2·37	9·82	9·84	2·97	0·74	0·43	0·49	2·33	1·39	1·80	2·12	3·66	7·37
Brisbane ... ..	2·80	8·43	18·19	2·45	2·40	0·17	0·77	2·83	0·67	1·77	2·25	1·28	1·99
Bundaberg ... ..	4·77	2·82	7·35	4·13	0·67	0·39	0·75	1·56	1·10	2·39	0·73	3·34	6·52
Dalby ... ..	0·17	4·88	7·61	0·11	0·37	0·63	0·14	1·80	1·13	2·55	3·65	1·56	1·46
Esk ... ..	2·61	10·06	17·04	2·83	1·07	0·23	0·46	2·75	2·16	1·29	5·99	3·62	2·64
Gatton Agric. College	...	3·38	10·74	...	0·10	0·16	0·6	2·71	1·84	1·93	5·71	1·29	1·94
Gympie ... ..	6·26	11·77	8·08	1·87	2·00	0·38	1·16	2·87	1·37	2·49	2·58	3·97	3·86
Ipswich ... ..	1·32	6·63	13·77	2·71	1·14	0·12	0·47	3·23	1·19	1·48	5·09	1·05	1·37
Maryborough ... ..	5·62	8·07	11·40	2·52	1·05	0·46	0·81	1·98	1·05	1·84	1·92	1·64	8·36
Roma ... ..	0·04	6·38	2·51	0·22	Nil	0·55	0·63	1·38	1·12	2·15	2·79	1·68	5·19
Roma State Farm ...	...	...	...	...	...	...	1·27	0·73	...	...	...	...	...
Tewantin ... ..	10·42	12·47	14·39	7·59	8·66	0·75	1·97	2·70	2·18	2·30	7·50	4·12	6·44
Warwick ... ..	0·76	4·52	6·65	1·40	0·15	0·80	1·24	2·99	1·96	0·96	5·28	2·02	0·87
Westbrook State Farm	0·43	8·03	1·41	1·40	00·5	...	0·49	1·97	...	...	2·05	...	...
Yandina ... ..	8·37	14·47	16·62	5·45	4·59	0·58	2·64	2·18	1·50	3·10	6·03	2·75	6·69

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,  
Divisional Officer

## Poultry.

### DISEASES OF POULTRY.

Although poultry in Queensland are not very subject to diseases, mainly owing to the genial climate rather than to the care of their owners, still an epidemic disease will sometimes pass like a wave over a whole district, leaving devastated poultry-yards in its wake. In such cases as this there is nothing to be done but to bury the departed birds. There are, however, isolated cases of disease, which, if taken in time, can usually be cured; and it is, therefore, advisable to know the symptoms of such diseases, as well as the best means for prevention and cure. Such are:—

**ROUP.**—This disease is not an uncommon one, but if taken in hand at once is comparatively easy to cure. A bird suffering from this complaint has a discharge from the nostrils and eyes, which smells most offensively. There is also a disinclination to roost, and the patient huddles itself up in a corner, both at night and during the day. When roup is first suspected, bathe the nostrils and eyes with chlorinated soda and water (one part of former to two of latter). If the discharge is very bad bathe two or three times during the day, the patient being housed in a coop, free from draughts, with a layer of clean hay or straw for bedding. Feed on wheat or good clean bran and pollard, mash with a little cayenne pepper, or chillies cut fine. When signs of improvement are manifest, add a little sulphur to the soft food two or three times a week. As in the case of cholera, everything that the birds have access to should be thoroughly cleansed and disinfected, as roup is highly contagious. There are several “roup cures” on the market, and these can be used with advantage, but in the case of them not being procurable, if the foregoing instructions are carried out the chances are all in favour of the birds’ recovery.

**CATARRH** is a disease very similar in its symptoms to roup, but there is usually a distinct coughing and wheezing as well. Use the same treatment as for roup.

**CROP-BOUND.**—This can hardly be described as a disease, and is caused principally by over-feeding with grain, which swells with the moisture in the crop and blocks the entrance of the pipe leading to the gizzard. Long grass also is a frequent cause of a bound crop, through its getting jammed in the outlet. The mode of procedure to effect a cure is to give the bird an emetic of a strong mixture of epsom salts and tepid water. Then hold by the legs with head down and gently knead and rub the crop with the hand. It may take a long time to empty the crop by this means; but, if not successful, then the crop must be opened and cleaned out. This is rather a delicate operation, but if great care is exercised it should not be a failure. Pluck the feathers from the breast immediately over the swelled crop, and make an incision 1 in. or 2 in. long. The crop can then be cleaned out and the outlet cleared. This is not by any means a pleasant job, as the smell is very offensive, especially if the bird has been suffering for any length of time. Having thoroughly cleaned out the crop, the edges of the cut must be neatly brought together and sewn with white silk, using a surgical stitch—that is, making each stitch complete in itself. After sewing the crop skin, the outside skin must be treated in a like manner. The greatest care must be taken that the crop is not sewn to the outside skin. After the operation the bird must be fed only on soft food for a week at least, and then gradually broken in to hard food again.



**BUMBLE-FOOT.**—This is a swelling of the foot, which is caused by the fowls jumping from a high perch on to a hard floor, or from fighting through wire netting with other birds. If it is noticed early, frequent applications of iodine ought to effect a cure, but, if that fails, then the swelling must be cut and the matter extracted. To do this, make a cross cut in the foot and the matter can be worked out. Then wash the wound thoroughly with a weak solution of carbolic and hot water, and bandage. Keep the bird in a well-bedded coop for about a week or ten days, and it will then be all right again, if all the matter has been extracted.

**CHOLERA.**—The most deadly—in Australia about the most uncommon—disease is cholera. Although there are some who claim that birds suffering from this can be cured, it is very doubtful indeed, and in the instances of cures said to have been effected, the writer doubts if it were really cholera, as the symptoms of other diseases closely resemble those of this complaint. The cause is generally impure water, and the principal symptoms are as follows:—The affected bird mopes about by itself and seems to have an unquenchable thirst, while the droppings are of a bright green colour and watery. Do not try to cure a bird that you are convinced has cholera, but chop its head off and *burn* it. Then clean out all the drinking vessels and feeding troughs with boiling water, and thoroughly disinfect all the houses and nests with limewash to which has been added about 2 per cent. carbolic oil. This is to prevent the disease from spreading.

---

### A LARGE STATION.

We have some fairly large cattle stations in Australia, but no consolidated run here comprises 30,000 square miles. Such an area is, however, held in Chihuahua, in Mexico, by Don Luis Terrazas. This large territory extends for 150 miles from north to south, and 200 miles from east to west. That is to say, that the millionaire owns a property which may best be imagined by drawing a line from Brisbane to Bundaberg towards the north, and from Brisbane to Miles towards the west, and connecting these by two lines meeting near Banana. On this enormous area the Don runs 1,000,000 cattle, 700,000 sheep, and 100,000 horses. He employs over 2,000 shepherds, horsemen, cowmen, hunters, and line men. All slaughtering and meat packing are done on the station, 150,000 cattle and 100,000 sheep being slaughtered annually at its meat works. The farm-house is the most magnificent in the world. It cost £32,000 to build, and is more richly furnished than many a royal palace.

In the Argentine Republic there are farms of enormous extent. One land holder, General Julio A. Roca, twice president of the Argentine Republic, has 192,000 acres in alfalfa (lucerne), or 300 square miles. Messrs. Salaberry, Labor, and Bercetche, of Cordoba, have nearly 100,000 acres more, and La Germania Estancio Land Company about 110,000. There are also many who own large areas planted in alfalfa far exceeding the Texas man. Mr. McKeon himself claims to have ten times as much as Mr. Smythe (1,400 acres under lucerne), and is now putting down 4,800 acres additional. This looks great news for the beekeepers, for in South America the cattle are allowed to graze on the alfalfa almost the year round. In Chili and Peru there are also vast areas set aside for alfalfa. As a matter of fact, the culture of alfalfa in this country is only in its infancy, and in time we shall see similar areas in Texas and California.







*Sloanea patidisearum*, Fr. M.

## Botany.

### CONTRIBUTIONS TO THE FLORA OF BRITISH NEW GUINEA.

By F. MANSON BAILEY, F.L.S., Colonial Botanist.

The plants enumerated in this paper were collected by Mrs. H. P. Schlencker at Boku, in British New Guinea, in 1908. Some of those mentioned, although enjoying a wide range in tropical countries, have not to my knowledge previously been recorded for British New Guinea, although they are recorded from Kaiser Wilhelmsland; others are probably rare in parts which have been visited by botanical collectors, thus a notice in this Journal may be useful to many.

#### Order STERCULIACEÆ.

*Sterculia quadrifida*, R. Br. See Ql. Fl., 136. Papuan name, "Masena."—*Mrs. Schlencker*.

#### Order TILIACEÆ.

*Sloanea paradiseorum*, F. v. M. Papuan Plants, 85. Baron Mueller says—"I have given this plant its particular specific name because it came from the forest haunts of the birds of Paradise."

A tree, attaining a height of 40 ft. Leaves crowded at the ends of the branchlets, oval-oblong, obtuse or acuminate at the apex, cuneate or rounded at the base, serrate and crenulate on the somewhat wavy margins, 4 to 7 in. long, 2 to 4 in. wide; petioles,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long, slightly hairy as well as the midribs. Flowers, unknown. Fruit, a woody echinate capsule with a dense covering of straight bristles, 1 to  $1\frac{1}{2}$  lines long; 3 or 4 celled, 3 to 4 in. long. Seeds forming 2 rows, and numbering about 16 in each cell, sessile, oval-elliptical, angular from mutual pressure, entirely included in a yellow or orange-coloured arillus, thus rather more than  $\frac{1}{2}$  in. long. Cotyledons almost as long as the albumen; radicle very short.—F. v. M. in part.

#### Order LEGUMINOSÆ.

##### TRIBE PHASEOLEÆ.

*Flemingia strobilifera*, R. Br., in Hook. Fl. Brit. Ind. ii. 227. An erect shrub, 5 or more feet high; the branches slender, terete, velvety. Leaves obovate, subacute, broadly rounded at the base, subcoriaceous, 3 to 6 in. long, glabrescent above, thinly silky on the underside, ribs raised, erecto-patent parallel; petioles  $\frac{1}{4}$  to 1 in. long. Raceme axis zigzag, 3 to 6 in. long. Bracts cordate,  $\frac{1}{2}$  to 1 in. long, membranous, finely downy, rather broadened than long. Calyx  $\frac{1}{4}$  in. long, teeth lanceolate, exceeding the tube. Corolla purple, little exerted. Pod oblong, turgid, under 1 in. long, 2-seeded. There are several varieties of this species met with in tropical countries.

##### TRIBE DALBERGIEÆ.

#### INOCARPUS, Forst. Chas. Gen. 65, t. 33.

*I. edulis*, R. and G. Forster. Papuan name, "Quaba," *Mrs. Schlencker*. A tall, erect tree, bark smooth, branches spreading or drooping. Leaves alternate, oblong, emarginate, entire, of a glossy green, 6 to 12 in. long, and 3 to 4 wide. Stipules minute or caducous. Spikes or racemes solitary or in pairs, shorter than the leaves. Flowers yellowish, fragrant. Calyx bilabiate. Corollas funnel-shaped, 5-cleft. Stamens 10 in a double-series, inserted in the tube; anthers oval near the mouth of the corolla. Ovary superior, 1-celled, containing 1-ovule, attached at the top of the cell. Drupe obliquely oval, flattish,  $2\frac{1}{2}$  in. broad, and 1 in. thick, of a fibrous texture, somewhat yellowish when ripe. A native of the islands of the Pacific Ocean and the Indian Archipelago. Wherever grown the fruit is prized for food.



## Order ROSACEÆ.

*Rubus moluccanus*, Linn. See Ql. Fl., 526.

## Order RUBIACEÆ.

## TRIBE NAUCLEÆÆ.

*Uncaria appendiculata*, Benth., in Hook. Lond. Journ. of Bot. 11, 222. A rambling plant, the branches 4-angular and pubescent, leaves ovate-rotundate, subcordate, 3 to 4 in. long, 2 to 3 in. broad, hairy-tomentose on the under-side, less so on the upper. Stipules bipartite, long as the petioles. Peduncle 1 to 2 in. long, rusty-hairy, tapering upwards, involucrate and articulate above the middle. Calyx short, segments linear with teeth between them.—Benth. l.c., in part. Like our Australian species, this species also might likely yield a catechu of equal value to Gambier or *Terra japonica*, a commercial product. See note, page 746, Ql. Flora.

## TRIBE MUSSÆNDEÆ.

*Mussænda frondosa*, Linn. In the packet were three forms of this beautiful plant, the material, however, was insufficient for determination.

## TRIBE PSYCHOTRIÆÆ.

*Geophila reniformis*, D. Don. See Ql. Fl., 772.

## TRIBE IXOREÆ.

*Ixora timorensis*, Dcne. See Ql. Fl., 765. Papuan name, "Loku."—Mrs. Schlencker.

## Order LOGANIACEÆ.

*Fagraea morindæfolia*, Blume Rump. 11-32 and Mus. Bot. 1-169. A rambling shrub. Leaves ovate-oblong, 6 to 10 in. long, shortly acuminate, 4 to 5 in. broad, subundulate, the margins often recurved, on stout petioles of about 1 in. Flower-racemes with peduncles from 1 to 1½ ft.; the flowers in dense cymes on short peduncles. Flowers about 1 in. long, corolla-tube ventricose, lobes spreading. Berry about 1 in. long, ovoid-elliptic.

## Order SOLANACEÆ.

*Physalis minima*, Linn. See Ql. Fl., 1092. Papuan name, "Godu Karava."—Mrs. Schlencker.

## Order SCROPHULARINEÆ.

*Vandellia crustacea*, Benth. See Ql. Fl., 1110.

## Order ACANTHACEÆ.

*Justicia Gilligani*, Bail. Ql. Agri. Journ. iii., 157.

## Order VERBENACEÆ.

*Clerodendron floribundum*, R. Br. See Ql. Fl., 1183.

## Order LABIATÆ.

*Moschosma polystachyum*, Benth. See Ql. Fl., 1188. Papuan name, "Loga."—Mrs. Schlencker.

## Order NEPENTHACEÆ.

*Nepenthes Kennedyana*, F. v. M. See Ql. Fl., 1278.  
 „ *Cholmondeleyi*, Bail. See Ql. Fl., 1281.

## Order ARISTOLOCHIACEÆ.

*Aristolochia indica*, Linn. See Ql. Fl., 1283.

**Order PIPERACEÆ.**

*Piper caninum*, *Blume*, Hook. Fl. Brit. Ind. v. 82. A rambling climber, hirsute, pubescent, or glabrate, branches slender terrete. Leaves membranous ovate, ovate-cordate, or lanceolate acuminate, rarely elliptic-lanceolate, 3 to 5 nerved towards the base, 2 to 4 in. long,  $1\frac{1}{2}$  to 2 in. broad. Male spikes 2 to 3 in. long, bracts adnate by a broad base; stamens 2; anther-cells distinct. Fruiting recemes 1 to 2 in. long, including the peduncles; bracts peltate, villose. Fruit 2 lines diam., pedicel variable in length, always shorter than the fruit. There are several named varieties of this species, and perhaps several of these are to be met with in British New Guinea.

**Order CASUARINEÆ.**

*Casuarina equisetifolia*, *Forst.* See Ql. Fl., 1490. Among the specimens were some to show the peculiar flabellate fasciation of the genus.

**Order CUPULIFERÆ.****TRIBE QUERCINEÆ.**

*Castanopsis*, *Spach.* Habit and character of *Quercus* Sect. *Chlamydoalanus* differs in the closed fruiting involucre, enclosing 1 to 4 nuts, and being covered with clusters of spines or tubercles, and often splitting irregularly.—Hook, Fl. Brit. Ind. V. 619. The species are met with in India, America, Malay Archipelago, and South China.

*C. Schlenckeræ*, *Bail. sp. nov.* (After the collector, Mrs. Schlencker, of British New Guinea, a daughter of the late J. G. Cribb, to whom Queensland is indebted for the introduction of varieties of American fruits, &c.) An evergreen tree of graceful habit and medium height. Papuan name "Iaro," *Mrs. Schlencker*. Branchlets very dark coloured, prominently striate, and dotted with white lenticels. Leaves broad lanceolate, with long narrow points, margins wavy, about  $3\frac{1}{2}$  in. long,  $\frac{3}{4}$  to  $1\frac{1}{4}$  in. broad; petioles slender,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long; upper side of leaf-blade glabrous, dark-green, under-side thinly tomentose, whitish; nerves arched, about 9-pairs, the reticulate veins very close, but faint. Inflorescence terminal and in the axils of the upper leaves; sometimes solitary, slender, monœcious spikes, but mostly forming elongated panicles of slender, erect, or drooping branchlets, about  $2\frac{1}{2}$  in. long, bearing sessile male and female flowers. Bracts densely-hairy exceeding the perianth. Perianth cup-shaped, about 1 line diam., very hairy inside at the base, hairs white. Stamens about 10, twice as long as the perianth; filaments hairy, anthers rather large. Involucre about 6 lines long and 4 lines broad, somewhat 3-angular, the side facing the axis without tubercles, the others with scattered tubercles solitary or in clusters, the points hard and glabrous, the whole outside of the involucre clothed with a thin tomentum, the inside with appressed silky hairs, more or less split at the top, showing the rusty-hairs with which the nut is clothed and the remains of the stigmas at its apex. The nuts are used for food by the Papuans.

**Order CYCADACEÆ.**

*Cycas papuana*, *F. v. M. Papuan Plants*, 71. Papuan name, "Warnara," *Mrs. Schlencker*. Petioles unarmed; segments of leaves rather short and narrow, flat, glabrous, opaque beneath, not pungent, sessile, with broad slightly decurrent base. Fruit rhachis, velvety-downy, long-stalked; its terminating lamina hard, rhomboid, acuminate, toward the summit toothed, at the apex short-laciniate, on the upper side finally glabrescent. Fruits several, ovate-globular; from the commencement glabrous. On the Fly River—D'Albertis. The above is F. v. M.'s notice, l.c. I have only fruits in the packet of specimens under notice.

**Order ORCHIDEÆ.**

*Eria australiensis*, *Bail.* See Ql. Fl., 1541. Judging from the solitary specimen to hand, it cannot be separated from the Australian species.



## Order SCITAMINEÆ.

*Curcuma australasica*, *Hook.* See Ql. Fl., 1593.

## Order COMMELINACEÆ.

*Commelina ensifolia*, *R. Br.* See Ql. Fl., 1652.

## Order GRAMINEÆ.

*Panicum hermaphroditum*, *Stend.* See Ql. Fl., 1829.

*Coix Lachryma-Jobi*, *Linn.* See Ql. Fl., 1848.

## Order LYCOPODIACEÆ.

*Selaginella Palu-palu*, *Bail.* Ql. Agri. Journ. ix., 215.

## Order FILICES.

*Lygodium dichotomum*, *Sw.* See Ql. Fl., 1934. From the outer rind of the smooth stems the Papuans obtain material which they plait into armlets and bracelets.—*Mrs. H. P. Schlencker.*

*Marattia fraxinea*, *Sm.* See Ql. Fl., 1944.

*Gleichenia flagellaris*, *Spreng.* See Ql. Fl., 1938. This is put to the same use as the *Lygodium*. Papuan name, "Gana."—*Capt. F. R. Barton.*

*Trichomanes javanicum*, *Blume.* See Ql. Fl., 1944. These specimens were more or less covered by the hair-like sterile mycelium of a fungus, probably *Marasmius equicrinis*, *F. v. M.* Horse-hair fungus. The caps should, however, be looked for, as the species may prove new.

*Dicksonia davallioides*, *R. Br.* See Ql. Fl., 1950.

*Davallia parallela*, *Wall.* A Malayan and Polynesian species.

*Lomaria capensis*, *Willd.* See Ql. Fl., 1964.

*Polypodium phymatodes*, *Linn.* See Ql. Fl., 1985. I take the opportunity of publishing another *Polypodium*, a fertile frond of which I received some time ago from the Rev. Copland King, of British New Guinea, namely:—

*P. (Lecanopteris), Curtisii*, *Baker.* *Hook.* Ic. Pl. 1607. Rhizome, hard, woody, this portion to hand, about 2 in. long and  $1\frac{1}{2}$  in. broad, seems to have been taken off rock or bark, showing to have borne 6 fronds, the bases of which for a short distance up are swollen and connected with each other, and probably when fresh were of a succulent or spongy character, but in the dry state have the appearance of crumpled glaucous leather. Stripes articulate about  $\frac{1}{4}$  in. above the swollen part, then somewhat angular for about 5 in., and like the rhachis of a bright brown. Frond deeply pinnatifid, lanciform in outline, about 14 in. long; pinnae horizontal, about 2 in. long, 3 to 5 lines broad. Sori marginal, occupying the whole of an oval lobe, from 1 to  $1\frac{1}{2}$  lines long. These fertile lobes are situated at the crenulations of the pinnae. Venation primary erecto-patent, the anastomosing veins mostly hidden in the substance of the frond. Mr. J. G. Baker gives Sumatra as the habitat. Perhaps this plant, when better known, may prove only another form of *P. (Phymatodes) lomarioides*, *Kunze.*

*Grammitis involuta*, *Don.* Prodr. p. 14. *Hook.* Spec. Filic. v. 155, as *Gymnogramme (Selliguea) involuta*, *Don.*

Caudex long, creeping, paleaceous at the apex, with broad lanceolate scales, stipites subaggregated, stout, but compressed and winged. Fronds carnosio-coriaceous, a span to 1 to  $1\frac{1}{2}$  ft. long,  $\frac{3}{4}$  to 3 in. wide, simple lanceolate-acuminate, much attenuated at the base and narrowly decurrent on the stipes; costa broad, compressed, pale-coloured. Venation immersed, obscure; primary veins oblique, subcostuliform, very slender, connected by a network of secondary veins forming subuniform areoles with larger costal ones, sometimes including free veinlets. Sori linear, elongated, erecto-patent, but varying a good deal in direction, not quite extending to the costa or the margin.—*Hook.* l.c. Common in the mountain districts of India. The Papuan specimens show a small form or growth, the fronds being only about 7 in. long, and scarcely 1 in. broad.

## The Orchard.

### CODLIN MOTH-PROOF APPLES.

A correspondent of "N. Z. Farmer" writes:—Through many years I have observed, and have been very much struck with the fact, says an Australian correspondent, that in an orchard of 15 acres of badly-infested apples I never saw two varieties—the Keswick Codlin and Devonshire Quarrenden—affected by the codlin grub. The Keswick Codlin holds the first place in the Northern and Midland Counties of England as the earliest and best-cooking apple, and a good bearer, and this description equally applies in Victoria. The bearing properties of this apple-tree are something phenomenal on rich loams. Devonshire Quarrenden dessert is, in most people's estimation, the best early, and under good treatment one of the most prolific bearers. I have taken as much as 30 bushels of good fruit in one season off a single tree. Those two varieties want more space than 20 ft. each way for their great bearing capabilities and good treatment. In the same orchard was Red Cluster, a rather showy apple, but only of second quality. It grew close to acres of badly-affected Ribston Pippins, but no codlin moth attacked it.

---

### FIGHTING THE CODLIN MOTH.

How to combat the codlin moth is, says "N. Z. Farm," a very live question in Australia, as well as other parts of the world. Up to the present our experts have not pinned much faith in the discovery of a parasite which will attack the pest in the grub state. They point out that this method of attack would only minimise the evil. All the same, much interest attaches to the parasite which was recently discovered at Gosford, and the departmental officers are probing the possibilities of this friend of the apple-producer. Strange to say, only a few weeks ago a parasite of a different kind was struck in South Australia. The expert in Victoria, Mr. French, points out that frequently it has been discovered that species of the ichneumon fly lay their eggs in the moth's cysilids with good results; but, unfortunately, several insectivorous birds, in turn, prey upon the insects. These same birds not long ago ate up a ladybird which had been introduced in Victoria for the purpose of warring against the cabbage aphid. Mr. French contends that the best method of attacking the codlin moth is to spray with arsenate of lead, thus ensuring 98 per cent. of clean fruit. The moth is gradually decreasing in Victoria because of the general use of the spray referred to.

---

### SULPHUR FUMES FOR PRESERVING FRUIT.

Peel peaches, cut in halves and remove seeds; arrange in wooden tub, leaving a hole in centre for vessel that is to contain the sulphur. If 4 gallons of fruit is desired, pare enough fruit for 6 gallons, as this allows for shrinkage. When fruit is in tub, place sulphur at the rate of 1 teaspoonful to each gallon of fruit used, in vessel in centre of tub, ignite it and cover whole tub closely for 4 hours. Remove fruit, and place in stone jars; cover with a cloth. Fruit preserved in this way keeps fine all winter, and tastes like fresh fruit. Apples, pears, or tomatoes are delicious prepared this way.



## Apiculture.

### PROSPECTS OF AN EXPORT TRADE IN HONEY.

Mr. R. Beuhne, President of the Victorian Apiarists' Association, who was last year commissioned by the Minister for Agriculture (Vic.) to inquire into the prospects of establishing an export trade in Victorian honey, and report generally on apiculture as practised in the United Kingdom, Germany, and the United States of America, furnished, on his return to Melbourne, a very interesting report on the information collected by him concerning apiculture generally. He found the usual prejudice against the alleged eucalyptus flavour in Australian honey, although some of the importers were prepared to give Victorian honey some preference for manufacturing purposes on account of its greater density provided regular supplies could be depended upon. The price offered was  $2\frac{1}{4}$ d. to  $2\frac{1}{2}$ d. per lb. at port of arrival for palest samples—Yellow Box and Red Gum—and somewhat less for other. At this time the prices ruling for Jamaica and Chili honey in London were from 20s. to 32s. per cwt., and New Zealand honey, which is gathered from clovers and non-eucalypts, realized up to 45s.

One of the principal London dealers' firms, Messrs. A. Bredenberg and Co., held out no hope of our honey even getting a footing as table honey on the English market at anything like the price now obtainable for English honey. It is considered too strong for table use. When they were paying 32s. per cwt. for fine white set Jamaica honey, Australian was offering at 28s. in 1-cwt. cases containing two tins each. The report deals further with the method of creating a market, and marketing, shipping in bulk, and various other matters of vital interest to apiarists, and concludes with an account of legislation in other countries in connection with bee diseases.

The report will be found in the issue of the "Journal of Agriculture of Victoria," 10th November, 1908.

---

### SOME USES FOR HONEY.

It is but rarely that we see honey on the table as regularly as jam; yet it is a far healthier food than the latter. Take the following from the "British Beekeepers' Review" on "Honey as a Food and Medicine":—The wisest man that ever lived advised his son to eat of honey, "because it is good"; and Democritus, who lived to be a centenarian, attributed his freedom from illness and his prolonged life to partaking of honey as a regular part of every meal. Just lately we heard of a young lady, whose life was despaired of by the doctors, being spared, and recovering by the regular use of honey as a food. Scientists inform us that honey contains almost all the requirements of life-supporting food, added to which it requires little or no digestion. We are also informed that its use helps the intestines and the kidneys in performing their special functions. For growing children who crave for sweets, nothing better than honey could be given. Mahomet discovered this important truth before he wrote the Koran, where he speaks of honey as "this sweet wholesome substance, which sustains and strengthens the body, which cures all maladies, a thousand times preferable to the poisons administered by the doctor to the human race." Recently a doctor declared that he cured several stubborn cases of constipation by the steady use of honey, prescribing no

other medicine. In cases of nervous disorders it has been long recognised as an excellent tonic. Cuts, scratches, small wounds, chips, scalds, burns, and many similar small ills have been cured by an application of honey, or a salve in which honey formed the chief ingredient. Colds, coughs, sore throats, asthmatic irritation are frequently treated with honey. Bronchitis has been, if not cured, at least greatly relieved by its free use. Many very palatable drinks can be made from honey, and in hot summer weather no better use can be found for honey than converting some of it into a cooling and refreshing drink. Honey biscuits are pleasant eating, and should find a place on every tea table. Honey sweets have an agreeable and appetising effect on the palate. Honey vinegar is the best and most pleasant form in which this bitter relish can be found.

---

### MEAD.

We have on former occasions given recipes for making mead, but the following appear to us to be more satisfactory:—

Use 4 lb. of honey to each gallon of water; put it in a copper and boil it; skim till no scum arises, then put to each gallon  $\frac{1}{2}$ -oz. of hops. Boil half an hour longer, and drain while hot into a clean and sweet barrel. When lukewarm add  $\frac{1}{2}$ -oz. of yeast, which stir in the liquor. Bung down when it ceases working.

Symington's recipe is: Put 3 lb. of the finest honey to 1 gallon of water, and two lemon peels to each gallon. Boil it half an hour (well skimmed), then put in while boiling the lemon peel. Work it with yeast, then put it into the barrel with the peel, and bottle off in five or six months. If the mead is to be kept some years use 4 lb. of honey to the gallon.

Most of the recipes, briefly put, are in the following proportions:—One gallon of water, 4 lb. of honey,  $\frac{1}{2}$ -oz. of hops, lemon according to preference, and 1 tablespoon of brewers' yeast.

---

### NEW ZEALAND FLAX MILLS.

About four months ago we had a visit from a gentleman from New Zealand interested in the flax trade. He drew a rather doleful picture of the position of the flax mill owners, which was so precarious, owing to low prices for the fibre, and distance of many of the mills from the ever-decreasing source of supply, that he predicted the closing of many flax mills at no distant date. That his prediction has been verified is shown by the fact that at the present time there are only twenty-four flax mills, with a monthly output of about 950 bales, in active operation in Otago and Southland, as against seventy at this time last year. The swamping of the London market with Manila hemp (says the Otago "Daily Times") is a potent factor in regard to the industry here, and so long as prices keep as low as they are at present there will be few mills starting operations. The conditions ruling at present will, however, have a beneficial influence, in that flax areas—which by reason of the fact that they were being drawn on every three, and, in some cases, two and a half years, thus producing over-straining of the plants, four years' growth being required to bring the flax in this part of the Dominion to the point of maturity—will be all the better for this compulsory rest, and be more prolific when the next season takes up.



# Horticulture

## FLOWER GARDENING, No. 14.

### PLANTS SUITABLE FOR IN AND OUT DOOR CULTURE.

By THE EDITOR.

#### HOYA (Wax Plant).

The Hoya may be seen festooning the trees in many of the scrubs in Queensland. They are not very showy plants, but are exceedingly interesting, climbing by means of adventitious roots, which attach themselves, like ivy, to the surface with which they may come in contact.

*Hoya carnosa* is the most popular; it is commonly designated "Wax Plant" or "Honey Plant," the first, from the wax-like appearance of the flowers, and the other from the drop of nectar which hangs from each flower. This variety will thrive in an ordinary greenhouse. The Queensland indigenous Hoya is known as "*Hoya australis*," and is a very elegant species. The Hoyas require a well-drained soil, and do best if old lime and brick rubbish are mixed with it.

#### VARIETIES.

*H. carnosa*: A beautiful climber, with thick fleshy leaves and beautiful clusters of pinkish-white flowers, which look as if frosted. *H. carnosa variegata*: This variety can be grown out of doors against a brick wall in a warm aspect, but is seen to best advantage when grown in pots in a greenhouse. *H. bella* is more of a dwarf pendant bush than a climber; its flowers are very pretty. *H. imperialis* is a grand and very robust climber, with very large flowers.

#### STEPHANOTIS FLORIBUNDA.

This is one of the most lovely of the climbers, and its flowers are perhaps the most popular; they are exceedingly valuable to the florist and bouquet-maker, and are prized as first-class plants for exhibition. In the Southern States of the Commonwealth they are usually grown in the greenhouse, but in Queensland they thrive out of doors as well. The foliage is wax-like, and the flowers are pure white, and produced in abundant clusters. The plant may be grown in a pot and trained to a trellis, but is finest when in free soil, or in a large tub and trained to the roof. Great care should be taken to protect it from the mealy bug. The plants require a large supply of water, but less when growth has ceased. Pots should be well drained.

#### GLORIOSA.

This genus, so named from its magnificent flowers, ought to do well in Queensland. There are few species, but all are splendid. *Gloriosa superba* is the best known. It is a herbaceous perennial with tuberous roots, and does best in a rich sandy compost. The soil should be kept rather dry in winter, but great heat and moisture are required afterwards until the plants are in flower, when a lower temperature will cause the flowers to last longer. The leaves terminate in tendrils, which cling to other plants for support. They require a tall trellis, as the shoots attain a length of some yards.

#### VARIETIES.

*Gloriosa Rothschildiana*: This is a new plant, a magnificent climbing lily, first discovered in the Uganda district, near Lake Victoria Nyanza. It is the handsomest of the genus, its pure, glowing, crimson flowers constituting it one of the glories of tropical plants. On a single specimen thirty-seven flowers have been produced.



*Gloriosa Rothschildiana citrina*: The "Florida Agriculturist" says of this plant:—"A fine plant of *G. superba* clambers up among the branches of *Lasiandra macrantha*, and the contrast between the deep violet-purple flowers of the *Lasiandra* and the yellowish lilies of the *Gloriosa* is an indescribably beautiful one. *Gloriosas* have been grown in the poor, dry, sandy soil of Orange Co., Florida, and though they flowered well, and were great objects of beauty, they only show their full charm when grown in moister and richer soil. Some of the specimen plants are 9 ft. high. The tubers were planted in a mixture of leaf mould, old cow manure, and sand. The tubers, which are tooth-like in appearance, and often forked, are exceedingly brittle, and have to be handled very carefully. They are all perfectly hardy in Florida, and ought not to be disturbed after being planted. Only plants left in their places for years form large and fine specimens. A small tuber planted three years ago has pushed up three very vigorous flower stems, besides two small ones.

"The genus is divided into two sections—viz., the climbing and the dwarf, or non-climbing. All the species are natives of Africa, although *Gloriosa superba*, which is very common in western Africa, is widely distributed in tropical Asia as well. *Gloriosa virescens* is a species doing also very well in Florida. The flowers are deep orange and yellow. The segments are spathulate, and the margin not crisped, and but slightly undulated. *G. Plantii* is a variety of this species, with reddish-yellow flowers. The type was introduced from Mozambique. Another variety of this species is *G. Leopoldii*, with yellow flowers.

"*Gloriosa grandiflora* has wholly yellow flowers, the reflexing of the segments and their undulation approaching *G. superba*. *Gloriosa abyssinica* is an erect species, growing only 1½ to 2 ft. high, coloured like those of *G. virescens*, but with broader segments, not at all crisped at the margin. At present the still finer variety, *Gloriosa Rothschildiana citrina*, flowers side by side with the common species, *G. superba*, of which a grower in Orange Co., Florida, U.S.A., Mr. H. Nehrling, has about 100 blooming plants. The latter appears insignificant as seen in such close proximity with this gorgeous new comer. The plant is large and vigorous, about 7 ft. high, and the leaves are large, broad, and are arranged opposite along the stem. The flowers are about three times as large as those of *G. superba*. When opening, they are of a clear citron-yellow, with a feather-like band of a deep ruby-crimson up the middle of each segment. As the flower matures, the yellow assumes a more chrome tint, and the ruby-coloured band widens, while later the ruby colour suffuses the whole flower as it passes out of bloom. The colours of the flower, its large size, and exquisite form, are unique in the genus, and, like the type, the variety is a great acquisition. A beautiful illustration of the type appeared in 'The Gardener's Chronicle,' 23rd May, 1903, and of the variety, 16th September, 1905." The American florist has crossed the first flower of this variety with the pollen of *G. superba* and *vice versâ*, and hopes to obtain a number of distinct hybrids. *Gloriosas* come into flower within a year after the seed has been sown, if grown in rich soil.

"*Gloriosa Carsoni* is a fine new species. The first tubers were collected in the neighbourhood of Lake Tanganyika. It flowered for the first time at Kew in June, 1904. It is a very beautiful species, making a strong growth some 6 ft. in length, terminated by several flowering branches. The flowers have a diameter of 4 in., the colour of which is brownish-red, each segment having a margin of golden yellow. *Gloriosa minor*, from North-eastern Equatorial Africa, is a singular plant, the flowering specimens of which are only 3 or 4 in high. With regard to the stability of the characters, 'climbing' and 'dwarf' or 'non-climbing,' it is very probable that under certain circumstances the climbing plants may become dwarf, as do many climbing plants under cultivation when the means of climbing are lacking. By the same rule the non-climbing, I am inclined to think, might assume a climbing



habit if growing in woody districts, or in places where the use of the prehensile, tendril-like continuation of the leaves would enable them to rise to a situation more favourable to the production of their flowers if crowded by a strong-growing vegetation. All the species, dwarf and climbing, have in a greater or less degree these tendril-like continuations of the leaves except the very small *G. minor*, from which perhaps ages of existence in open situations, and probably in very shallow soil, have almost if not entirely eliminated this feature. There are a few plants allied to the Gloriosas which do very well in Florida, requiring the same treatment and showing the same habit, though not quite as showy." The climate of Queensland being very similar to that of Florida, should be well adapted for these showy plants. They appear above ground in July.

#### LOPHOSPERMUM.

This is another handsome climber (annual), which grows to a height of 10 ft., and bears large purple flowers. Sown in Autumn and Spring, in boxes, it may be planted out in a sheltered position as soon as the young plants can be safely handled.

#### MINA LOBATA.

A half-hardy climber. The flowers are in long racemes; when in bud, they are a vivid red, becoming orange-yellow before opening, and creamy-white when fully expanded. The whole plant is strikingly beautiful, the shoots attaining a length of 20 ft. The seed should be sown in Spring.

#### THUNBERGIA.

The Thunbergias are very pretty climbers, producing large quantities of flowers. If well grown, nothing can be prettier. They are half-hardy annuals of a twining habit, and grow rapidly to a height of about 36 in. Sow the seed in Spring in a compost of leaf mould, loam, and sand.

*T. aurantiaca* and *alba* are about the best varieties.

#### IPOMÆA.

The Ipomæas are beautiful climbers, valuable for covering trellises and fences. They have handsome convolvulus-like flowers, fine foliage, and are rapid growers. Hardy annuals, except *Learii*, which is a perennial, with deep-blue flowers. Sow in Autumn and Spring.

#### SOME GOOD VARIETIES.

*Hederaea superba*: Ivy-leaved, various colours; Mikado, brilliantly coloured flowers. *Grandiflora alba*: Magnificent white flowers. *Bona nox*: Bears most beautiful, large blue flowers, sweet-scented, which open in the evening. *Learii*: Deep-blue flowers. *Quamoclit* (The Cypress Vine): A distinct variety, having elegant feathery foliage, with clusters of small scarlet flowers.

#### MOONFLOWER (*Calonyction*).

This is a very strong grower, and spreads to a great distance. It thrives to perfection in this State, and may be seen in many gardens. The leaves are heart-shaped and bright green. The fragrant white flowers, 6 in. across, are produced in great profusion, and open in the evening. There is a new hybrid of the Moonflower, the flowers of which are larger, coming into bloom sooner, and opening earlier in the evening than those of the original Moonflower.

#### WISTARIA.

*Wistaria sinensis* is a large, strong-growing, climbing shrub, bearing large racemes of pale-purple flowers. *W. sinensis alba* is a white variety of similar habit and growth. In this State it flowers in September and October, and, after flowering, puts forth a mass of handsome pinnate foliage. Sir J. Paxton said that rigid pruning is indispensable to make it bear, on spurs

instead of on big branches, and plants, cut down to within a short distance of the ground, acquire a shrubby habit, and the produce flowers in abundance. That, however, has not been my experience, as I had to cut close to the ground a fine plant, with runners 20 ft. long, in order to admit of painting my house. The plant very soon assumed its former proportions, but it only put forth three flower racemes instead of dozens. The soil where the *Wistaria* is to grow should have a good quantity of sand mixed with it. It is propagated by layers and cuttings of the ripe wood.

#### VARIETIES.

*W. Bidwilli*; *W. magnasperma*; *W. sinensis*, bearing beautiful deep lilac flowers; *W. sinensis alba*, which is a white variety.

#### JASMINES.

These are too well known to need much description, but they cannot well be left out of a list of hardy climbers, as there is a considerable variety of them, and they are all graceful plants, with sweetly-scented flowers. Nearly all of the *Jasmines* are white, but there is a very handsome yellow one hailing from India. The flowers are a clear yellow, resembling in shape the perennial phlox.

#### VARIETIES.

*J. grandiflorum* resembles in leaf, flower, and fragrance the common English *Jasmine*; *J. heterophyllum*; *J. sambac* (Arabian *Jasmine*); the Double Arabian, or Tuscan *Jasmine*, bears flowers like little white roses; *J. scandens* bears corymbs of numerous, pure white, delightfully fragrant flowers.

#### CANARY CREEPER (*Tropæolum canariensis*).

A pretty, tender annual climber, of great beauty. The foliage is small, and the flowers golden yellow, somewhat resembling the form of an insect. It grows in course of time to a considerable height, and requires a trellis for its support. It cannot endure great heat; the seeds should, therefore, be raised in pots or boxes, and planted out in the Spring in some sheltered position.

#### PASSION FLOWER.

The different species of *Passion Flower* are rather numerous, but only some five or six are of any value in an ornamental point of view. They are tendril-bearing climbers, and grow with great rapidity, but soon exhaust the soil. They are easily grown from seed. The edible fruit-bearing variety is so well known in Queensland as to require no description here. It bears fruit twice a year.

#### VARIETIES.

*P. alata*: Calyx and petals, crimson; rays, variegated, white, purple, and crimson. *P. kermesina*: The most beautiful species in cultivation, except *P. racemosa*. The flowers are of a fine carmine crimson, and display themselves only where sheltered from the sun. *P. edulis*, *P. racemosa*: This very choice and handsome plant bears deep-red or scarlet flowers. Moss-rose *Passion Flower*: Otherwise called "Love-in-a-Mist," botanically known as *P. foetida*, is a very pretty, delicate climber, bearing aromatic edible fruits, contained in an outer covering, much resembling the involucre of the moss-rose. Grows wild in parts of Queensland.

#### BEAUMONTIA GRANDIFLORA.

A truly magnificent climbing shrub, with strong woody stem; spreads over an immense space its dense foliage-curtain of noble, verdant, oval leaves, 9 in. in length and 4 in. broad. Flowers trumpet-formed, resembling white lilies, 4 in. long and 3 in. across, with a faint, lily-like scent, borne



in large corymbs, and covering the plant with an entire mass of blossom. Propagated by cuttings or from seed. A very rapid grower.

There are many other pretty climbers which thrive well in Queensland, and which are so well known that they need not be described here. Such are: Ivy-leaved Geranium, Honeysuckle, Nasturtium, Sweet Peas, Convolvulus, Ivy, Creeping Fig, *Bauhinia scandens*, &c.

#### CLIMBING ROSES.

Gloire de Dijon: Yellow and buff. La France: Beautiful blush. Maréchal Niel: Rich golden yellow. Reine Marie Henriette: Bright rosy cerise. Cloth of Gold: Sulphur yellow. Climbing Niphetos: Magnificent pure white tea. Devoniensis: Creamy white. Souvenir de Madame Metral: Bright cerise red. Souvenir de Malmaison: Edges blush, deeper in centre. Waltham Climber: Deep crimson. William Allan Richardson: Beautiful orange-yellow; and many others stocked by nurserymen.

#### BANKSIAN ROSES.

These are all desirable for climbing purposes. They include *Banksia alba*, white; *B. fortunei*, large white; *B. lutea*, yellow.

#### ORNAMENTAL SHRUBS AND SHRUB-LIKE PLANTS.

##### DRACÆNA (Cordylina).

This is a very popular genus, the numerous species and varieties being remarkably handsome when well-grown and in good health. Their culture is simple; they thrive in ordinary rich compost, and, if grown in pots, these should be large, and abundantly supplied with water. In the Queensland coast climate they do well in the open. They somewhat resemble a small palm, have an erect stem, naked to the summit, upon which its long, lanceolate, sharp-pointed leaves are borne. They are much in request, owing to the ornamental colour of their foliage—some of a crimson hue, others partaking of a bronze-like metallic lustre. They are propagated by the suckers which they throw up.

##### VARIETIES.

*D. australis*: Unlike any of the Cordylines; is described above. *D. Draco*, *D. fragrans*, *D. nutans*, *D. cannaefolia*, all handsome tropical-looking plants.

##### CORDYLINA (syn. Dracæna).

*C. ferrea*: Dark-green leaves with crimson edges; bears large compact bunches of very numerous, small, rose-coloured, very pretty flowers. *C. terminalis* (The Sandwich Island Tee-plant): Foliage rich, light verdant green; bears feather-like sprays of numerous small, pure white flowers. *C. reflexa*: Leaves green, bears yellowish-green, sweet-scented flowers.

#### HIBISCUS.

Although there is a considerable number of handsome species of this genus in Queensland gardens, and nearly all are beautiful, there is not sufficient diversity of character in many to make it worth while to cultivate more than a select few. Most of them are very easily propagated by cuttings or seed. They require little attention, flower in any soil, with or without shelter, and produce a profusion of lovely large flowers.

##### VARIETIES.

*H. mutabilis*: Changeable Rose, a very large bushy shrub, growing to a height of 10 ft., and produces a profusion of large, very handsome, double flowers, something like immense double roses; white on first opening, then becoming cream-coloured, and finally of a deep rose tint. *H. rosasinensis* (Chinese Shoe Plant): In almost constant blossom, with its brilliant, crimson-scarlet flowers, with the long, pretty column of pistil and stamens projecting

from their centre. *H. Andersonii*: Dark crimson, with dark eyes. *H. chrysanthus*: Large-sized golden flowers, with a purple-crimson spot at the base, forming a dark-coloured eye; attains a height of 4 ft. *Syriacus*: This variety averages about 4 or 5 ft. high; bears large, lilac-blue flowers, with dark-purple eye. *H. S. alba*: Bears double white flowers. *H. Cooperii*: Red and white variegated. Besides these, there are other beautiful varieties to be obtained from our nurserymen.

#### CAMELLIAS.

Camellias thrive well here out of doors in favourable situations, where they can be protected from hot winds in summer, and from frosts when in flower. They thrive in light loam, well drained. In favourable soil the trees will grow to a height of from 12 to 20 ft. With proper attention fine specimens can be grown in large pots or ornamental tubs. They continue in bloom from May to September. The Camellia is not hardy in the colder districts of the State. The single white variety is highly ornamental in the shrubbery. The plants should stand about 10 ft. apart, and should be planted out early in Autumn—about April.

#### VARIETIES.

There are several hundreds of varieties of Camellias, amongst which some of the best are:—*Alba plena*, double white; Angelo Cocchi, white, striped rose; Camile Brozzoni, crimson, with white stripes; Isabella, large handsome white; Nivalis, pure white; *Virginia franco*, rose, changing to soft pink; Jouvain, rose, shading to crimson; *Imbricata*, white, striped with rose; La Pace, white-shaded rose, striped crimson; Henri Favre, salmon rose, fine shape; Camilio Galli, imbricated, white and red; Dionesia Poniatowski, pure white; Lafevriana, very large rich rose, &c.

Camellias are propagated by in-arching and grafting upon the single-flowered, also by cuttings inserted firmly in sand in March or April, and set in a shady close frame. Camellias are not so susceptible to frost as is generally supposed; indeed, the single-flowered varieties succeed trained against north aspect walls. Notwithstanding their comparative hardihood, the very best hybrid, double-flowered varieties do not bloom well, though laden with flower buds, in a too cold, damp greenhouse, excess of atmospheric moisture within which rots the buds of some. The lowest winter temperature in such places should be between 35 and 45 degrees. Enduring as these plants appear to be—apart from occasionally shedding their flower buds—one fact must not be lost sight of—*i.e.*, that they only thrive well in a light, open compost, comprising equal parts of peat and fibrous loam, with somewhat liberal additions of silver sand, rotten cow dung, and nodules of charcoal, over efficient drainage. If potted somewhat firmly, their comparatively large roots soon take possession, and, with sufficient waterings with manure water occasionally at the growing season, they retain good health and bloom freely for from three to four years without repotting, though an annual mulching with fresh rich soil over the roots is beneficial. The best time to repot them is either just as they begin growing, or immediately the tender young shoots attain to their full length, and growth is improved by giving them a little extra warmth, bottom heat in particular, with overhead syringings. It is all-important to turn them out of doors immediately the young growths attain to their full length.

#### RHODODENDRON.

This is a charming plant, eminently suited to all the cooler parts of the State. It is a hard-wooded, evergreen shrub, producing magnificent heads of flowers of a variety of colours. Many varieties prefer, as stated, the cooler districts, such as the Darling Downs or Herberton, but there are several which will thrive in almost any part of the Southern districts, out of doors, provided sufficient protection from the sun and our very infrequent hot winds



can be given. Planted in a sheltered situation, they will thrive in a satisfactory manner. They like a peaty soil, but will succeed in any light loamy or sandy soil that has been recently broken up, but rarely do well in soil that has been cultivated. It is beneficial to the plants to mulch the soil with fresh cow dung, which helps to retain the moisture and to keep down the temperature. Rhododendrons are easily raised from seed, but many varieties are propagated by grafting on seedling stocks in pots.

#### VARIETIES.

*R. Countess of Haddington*: This hybrid, although one of the oldest, is amongst the most beautiful of the Rhododendrons. It has rather small, dark-green leaves, and large, long-tubed flowers, somewhat drooping, and of a delicate blush-white colour. It is supposed to be a cross between *R. Dalhousiae* and *R. Gibsonii*. *R. Delavayii*: Flowers crimson, with black spots at base of the corolla. *R. intricatum*: Trusses five-flowered, corolla, violet or lilac, anthers orange-coloured. Other varieties are—*R. Veitchii*, *R. Duchess of Edinburgh*, *R. Princess Alice*, *R. Gibsonii*, *R. Ponticum*, &c.

#### ABUTILON.

A handsome family of evergreen, flowering shrubs, of free growth, suitable for any part of Queensland. Some of the varieties have variegated leaves, and are very handsome; but the whole family are attractive and profuse bloomers; their flowers are bell-shaped, and of various colours.

#### VARIETIES.

*A. Bedfordianum*: Bears large, pendulous, eardrop-like flowers with folded petals of a pale orange colour, prettily pencilled with brown lines. It should be renewed annually either from seed or cuttings. *A. marmoratum*: Produces beautiful erect flowers of the size and form of Canterbury Bells, rose colour, marbled with pure white veins. *Boule de Neige*, white; *Cloth of Gold*, golden; *A. Thomsonii*, orange and red. *Souvenir de Bonn*: Leaves have a margin of silver flowers, orange-yellow, veined with scarlet. *Golden Fleece*, yellow.

#### DATURA (Trumpet Flower).

This is a very large spreading shrub, with thick flaccid leaves. *D. suaveolens* makes a splendid appearance when in full blossom, with its immense, white sweet-scented flowers, of the size and shape of a cow-horn, the corolla expanded at the mouth with frilled edges. It does not yield seed, but is easily propagated by cuttings. *D. sanguinea*: A shrub of much smaller growth than the last, and leaves of a darker green; the flowers are also smaller and more tubular, with the rim curled over, of a dull deep red colour. *D. ceratocaula*: Large trumpet-shaped flower, beautifully sweet-scented, pink and white. *Double Golden*: A compact bush about 2 ft. high, bearing large golden, funnel-shaped flowers. Sow in Spring.

#### AZALEA.

The climate of Queensland is admirably suited to the cultivation of these beautiful shrubs, which are unequalled for richness and pureness of colour, and gorgeousness of display. They should be planted in masses, and a good strong soil is better suited for them than light soil, though they will succeed in either, provided it is not too dry. In very dry seasons they should be heavily watered about once a fortnight, but in seasons of normal rainfall such watering will not be necessary. Azaleas may be grown either out of doors, in the bush-house, or on the veranda as pot-plants. Pots should be 6 or 8 in.

## VARIETIES.

*Alba magna*, large white; Alice, deep rose, large vermillion blotch; Neptune, flowers a brilliant orange; Duke of Devonshire, salmon red; Fielder's White, perfectly pure white; Empress of India, gracefully wavy flowers, carmine, white, and salmony-rose (double); Marquis of Lorne, bright orange, saffron, yellow blotch; Madeline, pure white; Dame Mélanie, very bright rose, edged with pure white, carmine blotch; *A. sinensis* (*A. mollis*): This is a handsome species, producing large yellow, or flame-coloured, bell-shaped flowers. There are numbers of hybrids, far too numerous for detailed description, but the principal nurserymen either stock most of them or can obtain them for the amateur gardener.

## GARDENIA.

A most delightful shrub, with neat, handsome, glossy foliage; bears very large, double cream-white, sweetly-fragrant flowers, having much the appearance, in some varieties, as *G. florida* (Cape Jasmine), for instance. Gardenias are not very particular as to soil, but they thrive best in a warm situation. Some kinds will grow to a height of 6 or 8 ft.; but, by pruning, they may be kept to any small and convenient size. Propagated by cuttings.

## VARIETIES.

*G. florida*, *G. globosa*, *G. magnifica*, *G. radicans*, *G. Thunbergiana*, *G. lucida*. The latter is a large shrub, or rather small tree, with rich, olive-green foliage. It bears, at intervals, large, handsome, solitary, fragrant, white flowers, 3 or more inches across; blossoms beautifully in a dwarf condition, in which state it may easily be kept by pruning. *G. citriodora* is a desirable variety. When watering Gardenias, care must be taken not to sprinkle them overhead, when in bloom, or the delicate white flowers will stain and turn brown. After flowering is past, the plants may be pruned to any desirable extent.

## TECOMA.

The Tecomas are often mistaken for Bignonias by amateur gardeners. But the latter are usually furnished with tendrils, whilst the former have none. Tecomas are either climbers, semi-climbers, or tree-like shrubs. They have remarkably graceful foliage, and bear handsome flowers.

## VARIETIES.

*T. Velutina*, *T. capensis*: These two flower more or less all the year round. *T. Smithii*: Flowers, orange-yellow. *T. mackeni*: This is a semi-climber, and may either be used as a shrub or climbing plant.

## TRITOMA.

*Tritoma uvaria grandiflora* (Queen's Lily): A handsome tribe of grass-tree-like foliage plants, producing fine spikes of crimson and orange flowers; most beautiful for a back border. The plant is also known as the "Red-Hot-Poker Plant."

## VIBURNUM.

As ornamental foliage plants alone, these are well worthy of a place in the garden, but they are still more to be desired on account of their beautiful flowers.

## VARIETIES.

*V. lucidum*; *V. macrocephalum* (the gigantic Gueldre Rose); *V. opulus* (Gueldre Rose, or Snowball Tree); *V. plicatum*; *V. Sieboldtii*; *V. sinensis*, white; *V. suspensum* (height, 15 ft.); *V. tinus* (Laurestinus), one of the finest shrubs in cultivation, only suitable for the colder parts of the State.



## TELOPEA (Waratah).

*T. speciosissima*: A gorgeous Australian native plant, producing magnificent large heads of brilliant crimson flowers.

## SPIRÆA.

This genus contains the old familiar Meadow-Sweet of the English fields, besides several beautiful cultivated species. They are deciduous, free-blooming, and useful shrubs, which may be seen in many Queensland gardens.

## VARIETIES.

Anthony Waterer: Free-flowering, crimson, one of the best; height, 1 ft.; California, pink, 2 ft. *S. corymbosa*: A small shrub of slender, twiggy growth, about 2 ft. high; very pretty when in full blossom, with its small white flowers, borne in crowded compact heads on the ends of the twigs. *S. rupestris*, white, 2 ft.; *S. grandiflora*; *S. Douglassi*; *S. caryopteris* *Mastocanthus* (called Blue Spiræa). This is not a true Spiræa, but a suitable companion to the crimson variety. It is a most beautiful, free-blooming plant, and can be cultivated in pots or out of doors. It begins to flower when only a few inches high. The flowers are of a lovely rich lavender-blue colour. It blooms right through the season.

## CÆSALPINIA (Poinciana) GILLIESII (Bird of Paradise).

This beautiful, free-flowering shrub grows to a height of about 4 ft., and thrives well on the coast lands in the Southern part of the State, and also in the Northern interior as far as 400 miles west of Rockhampton. It has remarkably pretty, feathery, bi-pinnate foliage of minute leaflets, and bears large panicles of lovely flowers with pale yellow petals, from out of which proceed very long crimson stamens. It is apt to decay after two seasons, for which reason it is best to raise fresh plants every year from seed. When in seed, the seed-pods should be covered, before half-grown, with muslin, to protect them from the ravages of an insect which rarely fails otherwise to penetrate them and destroy the seed.

## POINSETTIA PULCHERRIMA.

A very large, spreading shrub, 8 to 10 ft. high. During the cool season it bears little knobs of yellow, insignificant flowers of the size of a pea, surrounded by rays of large, elliptical, crimson-scarlet, bracteal leaves. It blossoms on the wood of the current year. No plant strikes more readily from cuttings, and it thrives in almost any soil.

## PLUMIERIA (Frangipanni).

This plant is something like a small tree about 10 ft. high, not ill-looking when in full foliage and bloom, but remarkably uncouth when the succulent, gouty-looking stems are destitute of leaves, as they are in the cold months. It bears, during the hot season, at the ends of the stems, large corymbs of large, pure white, exquisitely fragrant flowers, with the interior of the cup yellow. Propagated easily by cuttings. There is an interesting and very pretty variety of this shrub, the unexpanded flower-buds of which are of a deep dark crimson colour. The borders of its petals curl upwards, and are beautifully edged with crimson.

## OCHNA.

*Ochna multiflora* is a free-flowering shrub, with bright-yellow flowers. The seed berries are very effective.

## PITTOSPORUM.

All the Pittosporums are highly ornamental, and are suitable for single specimens in the shrubbery. Their chief merit as ornamental plants consists entirely in their neat, shining green, dense foliage.

VARIETIES.

*P. eugenoides*: This variety is suitable for ornamental, evergreen hedges, as are also *P. undulatum* and *P. eugenoides variegata*; *P. Tobira* and *P.T. variegata* are also desirable kinds.

PLUMBAGO.

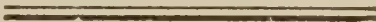
A favourite family of free-flowering shrubs. *P. capensis* is a small, prostrate growing shrub, which bears a profusion of pale, azure-blue flowers of the same size and form as those of the Phlox. *P. capensis alba* is a splendid shrub, bearing white flowers in great profusion. Other varieties are—*P. Larpentæ*, which produces flowers of a much deeper blue, and *P. rosea*, which bears crowded racemes of moderate-sized, pale, pinkish-scarlet flowers.

LAGERSTROEMIA.

A splendid, hardy, deciduous, free-flowering shrub. The flowers are very handsome; pink, white, and dark mauve.

VARIETIES.

*L. indica*: An erect-growing shrub, 3 or 4 ft. high, bearing, in unbounded profusion, large panicles of rather small, fringe-petalled, rose-coloured flowers. There is one variety with pure white flowers, and another with lilac flowers. The three varieties grown together form a most lovely ornament to the garden. *L. elegans*: This shrub is a most magnificent object when in full flower, with its great compact panicles of light-purple blossoms.



Times of Sunrise and Sunset at Brisbane, 1909.

DATE.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.42	5.40	6.20	5.57	5.46	7 Jan. ☉ Full Moon 0 13 a.m. 15 „ ☾ Last Quarter 4 11 „ 22 „ ● New Moon 10 12 „ 29 „ ☾ First Quarter 1 7 „  5 Feb. ☉ Full Moon 6 25 p.m. 13 „ ☾ Last Quarter 10 47 „ 20 „ ● New Moon 8 52 „ 27 „ ☾ First Quarter 0 49 „  7 Mar. ☉ Full Moon 0 56 p.m. 15 „ ☾ Last Quarter 1 42 „ 22 „ ● New Moon 6 11 a.m. 29 „ ☾ First Quarter 2 49 „  6 Apr. ☾ Full Moon 6 28 a.m. 14 „ ☾ Last Quarter 0 30 „ 20 „ ● New Moon 2 51 p.m. 27 „ ☾ First Quarter 6 36 „
2	4.57	6.46	5.22	6.41	5.41	6.19	5.58	5.45	
3	4.58	6.46	5.22	6.41	5.42	6.18	5.58	5.44	
4	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.43	
5	4.59	6.46	5.24	6.40	5.43	6.16	5.59	5.42	
6	5.0	6.47	5.25	6.39	5.44	6.15	6.0	5.41	
7	5.1	6.47	5.25	6.38	5.44	6.14	6.0	5.40	
8	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	
9	5.2	6.47	5.27	6.37	5.45	6.12	6.1	5.38	
10	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	
11	5.4	6.47	5.28	6.36	5.46	6.10	6.2	5.35	
12	5.5	6.47	5.29	6.35	5.47	6.9	6.3	5.34	
13	5.5	6.47	5.30	6.34	5.48	6.7	6.3	5.33	
14	5.6	6.47	5.30	6.33	5.48	6.6	6.4	5.32	
15	5.7	6.47	5.31	6.33	5.49	6.5	6.4	5.31	
16	5.8	6.47	5.32	6.32	5.49	6.4	6.5	5.30	
17	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.29	
18	5.9	6.47	5.33	6.30	5.50	6.2	6.6	5.29	
19	5.10	6.46	5.34	6.29	5.51	6.1	6.7	5.28	
20	5.11	6.46	5.35	6.28	5.51	6.0	6.7	5.27	
21	5.12	6.46	5.35	6.28	5.52	5.59	6.8	5.26	
22	5.12	6.46	5.36	6.27	5.52	5.57	6.8	5.25	
23	5.13	6.46	5.37	6.26	5.53	5.56	6.9	5.24	
24	5.14	6.45	5.37	6.25	5.53	5.55	6.9	5.23	
25	5.15	6.45	5.38	6.24	5.54	5.54	6.10	5.22	
26	5.16	6.45	5.38	6.23	5.54	5.53	6.10	5.21	
27	5.17	6.44	5.39	6.22	5.55	5.52	6.11	5.20	
28	5.17	6.44	5.40	6.21	5.55	5.51	6.12	5.19	
29	5.18	6.43	...	...	5.56	5.50	6.12	5.18	
30	5.19	6.43	...	...	5.56	5.48	6.13	5.17	
31	5.20	6.42	...	...	5.57	5.47	...	...	



## Tropical Industries.

### CARAVONICA COTTON.

The cultivation of Caravonica cotton appears to be gaining ground in many parts of the world, and Dr. Thomatis, of "Caravonica," Cairns, is now making a world's tour in the interests of the company who have acquired the sole right to the operations in connection with his business. It was stated that the doctor's plantation at Cairns had passed into the company's hands, but this is not so, as he has placed a manager in charge during his absence in Egypt, India, and Europe, and will resume his work there on his return. The Cuban correspondent of the "Journal of Agriculture of Jamaica" informs its readers that in Monte Cristo, in the most easterly part of Cuba, 1,500 ft. above sea level, was last Autumn planted about 15 acres with Caravonica silk, and about 50 acres with Caravonica wool cotton. Although the planting could not be done till the first days of December, as the seeds ordered from Australasia did not come before that time, the result is most satisfactory for both varieties. The trees have borne and are still bearing very richly. Samples of the cotton have been sent to several experts in America and Europe, and from all quarters the cotton has been praised for strength, gloss, and length of staple. By this enterprise it seems to be proved that of all kinds of cotton, known up to date, the Caravonica is the best one for planting in Cuba, as it possesses a considerable power to resist drought, storm, and insect pests.

We have planted our trees at the distance of 7 x 7 ft.; but, according to our experience, we will recommend planting 8 x 8 ft., as even at this time—in the middle of September—most trees have grown to a height of 11 x 12 ft., some of them are still higher. We shall have to prune them rather severely for giving them more sunlight and facilitate the picking.

After all, the enterprise seems to be a very profitable business. A new area is cleared, and when planting the new acreage—which planting is to take place in September—we shall have the great advantage of using our own selected and acclimatised seed.

This is a very interesting result. Cuba is cooler than Jamaica, and at 1,500 ft. the elevation would be equal to our 2,000 ft.

---

### DEMAND FOR SISAL FIBRE.

From an article in "Dalgety's Review," 1st February, on the sisal industry in Queensland, we take the following:—

"New industries often make slow progress for some years, though, ultimately, they forge their way to importance and success. The beaten tracks of work and trade are preferred to novel undertakings. Even the promise of large profits will hardly induce many to venture on untried occupations. Pioneers must be found to open them up, and, by their success, prove their worth, then others will follow. The sisal hemp industry in Queensland is passing through this initiatory stage. The demand for sisal fibre is always active. Large importations of rope and twine are always being made; it is estimated that there will be required for the wheat harvests of the Commonwealth this year 3,000 tons of binder twine, and the material for this could easily have been produced in Australia. Prices are good, sometimes reaching

almost £40 per ton. . . A fresh start needs to be made in this industry. Its value has been proved. Enthusiasts need not now paint it in glowing colours. It needs only the observant man to take it up for its real worth. It may not be generally known that the Commonwealth Government is offering a bonus of 10 per cent. on the market value of this product."

[The writer is slightly incorrect in stating that "no increase in the general acreage planted has recently been made. Since August last a large plantation has been in course of formation near Cairns, N.Q., by Mr. Thos. Mills, junr., who already has 50,000 plants growing; also in the South, near Brisbane, the Woolahra Park plantation has been gradually extended, until about 70 acres are now planted, and a considerable area is cleared and ready for planting when a good rainfall occurs. The St. Helena plantation has also been increased by several acres. The Central district plantation (Bajool), on the North Coast line, however, lately purchased by Mr. M. H. Moreton, is at present at a standstill. Mr. Jas. Cornwell has started a sisal plantation near Gladstone.—Ed., "Q.A.J."]

Mr. T. H. Wells, of Childers, has sent two consignments of plants—50,000 and 450,000 respectively—to Mombasa, in British East Africa.

---

### SIBERIA.

Many people still think that the word "Siberia" is synonymous with Arctic desolation, and a place of horrible exile for Russian malefactors and political offenders. As a matter of fact, the greater portion of Siberia (the southern) consists of splendid country for cattle-raising and dairying.

Before 1893 Siberia produced no butter at all for exportation. In 1893 the first modern-arranged dairy for producing butter for export was started at Bezirk, near Kurgan, and in 1898 there were 140 dairy farms in Siberia, exporting about 50,000 cwt. butter. In 1902 the number of dairy farms reached 2,035, and the export of butter in that year reached the amount of 690,000 cwt. In 1903 the butter exports were given at 2,487,000 lb., equal to, say, 830,000 cwt., and for 1907 they were roughly calculated at 1,084,000 cwt.

Siberia has always been considered one of the most benighted countries in the world, but apparently it is losing its bad name, and could show Australia points in the way of attracting immigrants. During 1907 more than 500,000 persons voluntarily emigrated from European Russia. Every colonist arriving in Siberia receives 37 acres of land free, paying no taxes for the first three years, and only half the regular taxes for the next three.

### WORMS IN PIGS.

To expel worms in pigs, the following may be used, with care, taken so that each animal gets a proper dose:—Santonine, powdered areca nut and calumba root, given in a little food after the pigs have been fasted for twelve hours. The following morning give each a dose of castor oil or Epsom salts, also on an empty stomach. The dose of santonine for a pig four months old is 5 gr., areca nut  $\frac{1}{2}$  dr., calumba root  $\frac{1}{2}$  dr., castor oil 1 oz., Epsom salts  $\frac{1}{2}$  oz. Particular attention must be paid to the sanitary condition of sties, frequently swilling them down with boiling water and some disinfectant, such as Sanitas. The common bowel worms of pigs are taken into the system either with the food or water. All food, both liquid and solid, should, for a time at least, be boiled before being given, and the animals should not be allowed to drink at ditches or pools.



## General Notes.

### THE FIRST SHEEP IN AUSTRALIA.

It is difficult to imagine that little more than a century ago sheep breeding was an unknown pursuit in Australia. According to an interesting account of the early history of pastoral farming in Australia in the "Melbourne Argus," in the first return of live stock published in 1788 the total number of sheep in Australia was only twenty-nine, so that the pastoral pursuit which to-day is so prominent and important a feature in the welfare of Australia may be said to extend over only a single century. The first introductions of sheep were made from the Cape of Good Hope, and, as might be expected, the animals were of an inferior description, and gave such a poor account of themselves, that the conditions in Australia were officially described as unsuitable for sheep, and led to the opinion being formed that the stock breeding resources of the country would depend upon cattle.

### WHAT NOT ADVERTISING COST HIM.

The "New York Farmer" relates a bit of history of a man who thought he would engage in the breeding of dairy cattle. So he bought an £800 bull and thirty cows at £60 each. After a time he had 100 fine heifers and bulls, and sat down waiting for the men who wanted nice stock (but couldn't tell where he lived or who he was) to come and buy his cattle. But they didn't come. He wouldn't advertise, so it was all money thrown away. He got discouraged and sold his 100 head to a shrewd buyer for £300. The purchaser engaged him to keep the stock till he could dispose of them, and set about at once advertising them, and the records and pedigrees of their ancestors. In a few weeks he had them all sold, at an average of £70 each, and went on his way rejoicing. Farmers everywhere seem to have a great aversion to advertising their live stock, seed grain, &c. But if they are going into the breeding of pure-bred stock of any kind they must seek their customers over a wide range of territory, for only here and there a man can be found who has the enterprise to want such stock.

### COAL TAR FOR THE PUMPKIN BEETLE.

A correspondent of the "Australian Field" writes:—

"I saw some time ago an article in 'The Australian Field and Fruit Grower,' treating of the so-called ladybirds on pumpkin plants. Now, I was told something which induced me to try an experiment. I treated the pumpkin seed for two rows thus: I used a little coal tar in the same way that we used to dress the seed corn to prevent its being eaten by bandicoots (any old farmer knows how), with the result that those rows were never touched by the pumpkin beetle, while the rest were completely destroyed. I hope this information may be of service to growers."

[The seed maize was treated with coal tar by Queensland farmers, in order to prevent the seed being eaten by bandicoots, but this had nothing to do with rendering the leaves immune to possible attacks of insects. It is difficult to see how tarring the pumpkin seeds would prevent destruction of the leaves by the beetle. As the writer, however, says that he has proved it to have that effect, the experiment would be worth trying.—Ed., "Q.A.J."]

## Answers to Correspondents.

### WIRE FENCES.

NEW CHUM, Bell—

A wire fence is more suitable for your district than post and rail. It is more easily erected, requires far less timber, hence involves less cartage, is not so easily destroyed by bush fires, and is easy to repair. The mainstays of such a fence are the strainer posts. (*See last month's Journal on reinforced concrete strainer posts.*) These posts at all corners and angles should be at least 12 in. in diameter, and they, as well as all other posts, should be barked. Set the strainer posts 4 ft. in the ground, and support them by means of stays, two to each. The stays should be strong—about 6 in. in diameter, heeled on to a mortice in the post, and 12 to 14 ft. long. Let the lower end into the ground, and butt it against a stout 3-in. piece of hardwood, driven 18 in. into the ground. Put in strainer posts at every 4 chains in the fence, and the other posts about 10 to 12 ft. apart. For smooth wire you may bore holes through the posts, which should be about 6 ft. 6 in. long, 8 in. wide, and 4 in. thick; but for barbed wire it is easier to fasten the wire to the posts by strong galvanised-iron dogs as soon as it is tightly strained. There are various implements used for straining, the simplest being merely a fork of a tree with a hole to admit the wire. It will strain and even break any ordinary fencing wire. For stretching barbed wire there is a handy tool which any blacksmith can make. It consists of a stout piece of steel about 1 in. wide and  $\frac{5}{8}$  in. thick. One end is forged after the fashion of a jemmy, but with claws like those on a carpenter's hammer. To stretch the wire, the claws are caught behind a barb in the wire, and the tool is plied round the post as shown in the accompanying illustration.

The cost of a wire fence depends upon the kind of wire used, the number of wires, the expense of carriage and labour, and the abundance or scarcity of timber for posts. Where the posts are 12 ft. apart, one or two droppers should be used to stiffen the fence.

To be perfectly sheep and lamb proof the fence should be at least 3 ft. 6 in. high above the surface of the ground, the lowest wire 6 in. from the ground, the next four wires 4 in. apart, the sixth 5 in. from the fifth, the seventh 6 in. from the one below it, and, if an eighth wire is used, it should be 9 in. above the seventh. This gives a height of 3 ft. 6 in. securely wired. The posts should be about 18 in. in the ground, and 4 ft. 8 in. above it. As a further safeguard for cattle, a ninth wire (barbed) may be placed 1 ft. apart from and above the eighth wire, making a total height of 4 ft. 6 in. Sheep and cattle wires may be from 10 to 12 gauge.

For cattle only, the lowest wire (barbed) may be 24 in. from the ground, the second 14 in. above the lowest, and the third 12 in. above that again (all barbed).

Neither of these fences is proof against pigs, as they will squeeze under or through very small spaces, between even barbed wire. The only wire fence of any use in this case is Mitchell's K fence.

### AMOUNT OF BARBED WIRE REQUIRED.

For two lines 100 ft. in length,  $12\frac{1}{8}$  lb.; for three lines,  $18\frac{3}{16}$  lb. Thick-set barbed wire, barbs 3 in. apart, run 450 yds., or 1 cwt. per coil.

Plain wire, No. 6 gauge, weighs  $28\frac{1}{2}$  lb. per 100 yds., about 502 lb. being required per mile. No. 8 gauge weighs 19·8 lb. per 100 yds., or 348 lb. per mile.



A No. 6 gauge 4-wire fence takes 17 cwt. 2 qr. 20 lb. per mile, and for 5 wires, 22 cwt. 0 qr. 11 lb.

A No. 8 gauge 4-wire fence takes 12 cwt. 1 qr. 4 lb. per mile, and for 5 wires 15 cwt. 1 qr. 12 lb.

Tying and repairing wire, 14, 16, and 18 gauge, runs from 2,322, 3,894 to 6,560 yds. per cwt.

Wire netting may be reckoned from 17 to 32 cwt. per mile, according to width and mesh.

At 9 ft. apart, 587 posts will be needed, and at 12 ft. 440.

### CURES FOR WARTS ON POULTRY.

R. W., Yatala—

We have already published several cures for warts on fowls. *See Journal*: Vol. VI., Jan., 1900, p. 23, and March, 1900, p. 233; Vol. X., May, 1902, p. 355; Vol. XIII., December, 1903, p. 591; Vol. XX., June, 1908, p. 288.

### ANALYSIS OF CARROTS.

MARKET GARDENER, South Brisbane—

Carrots are good food for all kinds of stock. The answer to your question as to the food value of the carrot is supplied by an English authority, and published in the "Australian Field" of 13th February, as follows:—

Carrots are said to be the only vegetable from which poison of some kind cannot be extracted. An English authority, in reply to a request for a statement of the composition of this useful root, says:—

The total percentage of food in carrots is as follows:—Total dry matter, 13 per cent.; crude albuminoids,  $1\frac{1}{4}$  per cent.; oil,  $\frac{1}{4}$  per cent.; carbohydrate,  $9\frac{1}{2}$  per cent.; fibre,  $1\frac{1}{2}$  per cent. The following is the digestible percentage:—True albuminoids,  $\frac{1}{2}$  per cent.; oil, 1-10 per cent.; carbohydrate and fibre, 10 per cent. Carrots are a very good food for stock of all kinds, but they are particularly valuable for horses and milking cows. Pigs eat carrots ravenously, and thrive quite well on them, while they also have certain medicinal properties. Carrots require good cultivation, and will do well on land that was manured for a previous crop, provided the ground is clear. The red carrot is most commonly grown, but the Belgian white carrot is an excellent variety, which grows quickly, and is of good quality. It is not good practice to grow carrots on freshly manured land, as the roots are apt to become forked and ugly.

---

## The Markets.

### PRICES OF FRUIT—TURBOT-STREET MARKETS.

Article.	JANUARY.	
	Prices.	
Apples (Hobart), per case ...	...	4s. to 6s.
Apples (Victorian), per case ...	...	4s. 6d. to 5s.
Apples (Local), per case ...	...	3s. to 5s.
Apples (Cooking), per case ...	...	3s. to 4s. 6d.
Apricots, per quarter-case ...	...	...
Bananas (Cavendish), per dozen ...	...	1d. to 2d.
Bananas (sugar), per dozen ...	...	1d. to 1½d.
Grapes (Choice), per lb. ...	...	1d. to 2½d.
Lemons (Italian), per case ...	...	12s. to 16s.
Lemons (Sydney), per case ...	...	8s. to 9s.
Mangoes, per case ...	...	1s. 6d. to 2s.
Nectarines, per case ...	...	...
Passion Fruit, per quarter-case ...	...	1s. 6d. to 2s.
Papaw Apples, per quarter-case ...	...	...
Peaches, per quarter-case ...	...	2s. 6d. to 4s.
Pears, per half-case ..	...	5s. to 7s.
Pineapples, best rough, per dozen ...	...	8d. to 1s.
Pineapples (Choice), smooth, per dozen ...	...	1s. 9d. to 3s.
Plums, per quarter-case ...	...	3s. to 4s.
Tomatoes, per quarter-case ...	...	1s. 6d. to 2s.

### SOUTHERN FRUIT MARKET.

Apples (Local), eating, per case ...	...	7s. to 15s.
Apples (Local) cooking, per case ...	...	3s. to 6s.
Apricots (Tasmanian), per quarter-case ...	...	2s. 6d. to 3s.
Apricots (Choice), per quarter-case ...	...	4s. to 5s.
Bananas (Queensland), per bunch ...	...	2s. to 5s. 6d.
Bananas (Queensland), per case ...	...	12s. 6d. to 13s.
Cherries, per quarter-case ...	...	...
Grapes (Queensland), Muscatels, per box ...	...	5s. to 6s.
Lemons (Local), per gin case ...	...	8s. to 16s.
Lemons (Italian), per half-case ...	...	17s. to 18s.
Lemons (Italian), per double case ...	...	25s.
Mandarins (Emperor), per case ...	...	8s. to 10s.
Mandarins (medium), per case ...	...	5s. to 6s.
Mangoes, per case ...	...	2s. to 3s.
Nectarines, per half-case ...	...	3s. to 6s.
Oranges (Choice), per case ...	...	6s. to 8s.
Passion Fruit (Choice), per half-case ...	...	2s. to 3s.
Peaches (Slipstones), per half-case ...	...	3s. to 5s. 6d.
Pears (Choice), per case ...	...	4s. to 7s. 6d.
Pineapples (Queensland), choice, Queen, per case ...	...	5s. to 6s.
Pineapples (Queensland), Ripley Queen, per case ...	...	3s. to 4s. 6d.
Pineapples (Queensland), choice common, per case ...	...	3s. to 4s.
Plums, per half-case ...	...	3s. to 4s. 6d.
Rock melons (Local), per case ...	...	4s. to 5s.
Rock melons (Queensland), per gin case ...	...	4s. to 5s.
Tomatoes (Local), per half-case ...	...	2s. to 3s.
Water melons (Queensland), choice, per dozen ...	...	10s.
Water melons, medium, per dozen ...	...	6s. to 8s.



PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR  
FEBRUARY.

Article.								FEBRUARY.	
								Prices.	
Bacon, Pineapple ...	...	...	...	...	...	...	lb.	10d. to 11½d.	
Barley, Malting ...	...	...	...	...	...	...	"	...	
Bran ...	...	...	...	...	...	...	ton	£5 to £6	
Butter, Factory ...	...	...	...	...	...	...	lb.	11d.	
Chaff, Mixed ...	...	...	...	...	...	...	ton	£5 10s.	
Chaff, Oaten ...	...	...	...	...	...	...	"	£4 15s. to £5 5s.	
Chaff, Lucerne ...	...	...	...	...	...	...	"	£5 to £7	
Chaff, Wheaten ...	...	...	...	...	...	...	"	£3 to £4	
Cheese ...	...	...	...	...	...	...	lb.	6½d. to 7d.	
Flour ...	...	...	...	...	...	...	ton	£9 10s.	
Hay, Oaten ...	...	...	...	...	...	...	"	£6 to £6 10s.	
Hay, Lucerne ...	...	...	...	...	...	...	"	£4 10s. to £5 5s.	
Honey ...	...	...	...	...	...	...	lb.	2d. to 2¼d.	
Maize ...	...	...	...	...	...	...	bush.	4s. 4d. to 4s. 6d.	
Oats ...	...	...	...	...	...	...	"	3s. 9d. to 4s. 3d.	
Pollard ...	...	...	...	...	...	...	ton	£6 to £6 5s	
Potatoes ...	...	...	...	...	...	...	"	£7 10s. to £8	
Potatoes, Sweet ...	...	...	...	...	...	...	"	...	
Pumpkins ...	...	...	...	...	...	...	"	...	
Wheat, Milling ...	...	...	...	...	...	...	bush.	3s. 9d. to 4s.	
Wheat, Chick ...	...	...	...	...	...	...	"	3s. 9d.	
Onions ...	...	...	...	...	...	...	ton	£7 10s to £8 10s.	
Hams ...	...	...	...	...	...	...	lb.	10d. to 1s. 1½d.	
Eggs ...	...	...	...	...	...	...	doz.	11d. to 1s. 4d.	
Fowls ...	...	...	...	...	...	...	pair	3s. to 3s. 6d.	
Geese ...	...	...	...	...	...	...	"	5s. 6d. to 6s.	
Ducks, English ...	...	...	...	...	...	...	"	2s. 6d. to 3s 3d.	
Ducks, Muscovy ...	...	...	...	...	...	...	"	3s. 6d. to 5s.	
Turkeys (Hens) ...	...	...	...	...	...	...	"	6s. 6d. to 8s.	
Turkeys (Gobblers) ...	...	...	...	...	...	...	"	7s. 6d. to 18s.	

ENOGGERA SALEYARDS.

Animal.								JANUARY.	
								Prices.	
Bullocks ...	...	...	...	...	...	...	...	£9 17s. 6d. to	
								£10 12s. 6d.	
„ (single) ...	...	...	...	...	...	...	...	£11	
Cows ...	...	...	...	...	...	...	...	£7 15s. to £9 2s. 6d.	
„ (single) ...	...	...	...	...	...	...	...	£9 10s.	
Merino Wethers ...	...	...	...	...	...	...	...	17s. 3d.	
C.B. „ ...	...	...	...	...	...	...	...	15s. 3d.	
Merino Ewes ...	...	...	...	...	...	...	...	13s. 9d.	
C.B. „ ...	...	...	...	...	...	...	...	18s.	
Lambs ...	...	...	...	...	...	...	...	12s. 3d.	

## Orchard Notes for April.

By ALBERT H. BENSON, M.R.A.C.

### THE SOUTHERN COAST DISTRICTS.

The gathering and marketing of citrus fruit, as well as of pines, bananas, custard apples, persimmons, &c., is the principal work of the month. In the Notes for March I drew attention to the necessity for keeping all pests in check, particularly those attacking the ripening fruit. As it is the height of folly to look after the orchard thoroughly during the growing period of the crop and then to neglect the crop when grown, every possible care must be taken to keep fruit fly, peach moth, black brand, or other pests that destroy or disfigure the fruit in check, and this can only be accomplished by combined and systematic action. Citrus fruit at this time of the year often carries badly, as the stem is tender, easily bruised, full of moisture, and, consequently, very liable to the attacks of the blue mould fungus, which causes specking. The loss from this cause can be lessened to a considerable extent by carefully attending to the following particulars:—

- 1st. Never allow mouldy fruit to hang on the trees or to lie about on the ground. It should be gathered and destroyed, so that the countless spores which are produced by the fungus shall not be distributed broadcast throughout the orchard, infesting many fruit, and only waiting for a favourable opportunity, such as an injury to the skin by an insect or otherwise, combined with favourable weather conditions (heat and moisture), to start into growth.
- 2nd. Handle the fruit carefully to prevent bruising. Cut the fruit, don't pull it, as pulling is apt to plug the fruit—that is to say, to either pull the stem out or injure the skin round the stem—and a fruit so injured will go mouldy.
- 3rd. Sweat or dry the fruit thoroughly; if the weather is humid, laying the fruit out in the sun on boards or slabs is a very good plan.
- 4th. After sweating, examine the fruit carefully, and cull out all bruised or punctured fruit, and only pack perfectly sound dry fruit. It is better for the loss to take place in the orchard than for the loss to take place in the case in transit.
- 5th. If the mould is very bad, try dipping the fruit for a few seconds in a 2 per cent. solution of formalin. This will kill the spores, and if the fruit is placed in the sun and dried quickly before packing there will not be much chance of its becoming reinfested.

Don't gather the fruit too green, especially such varieties as the Beauty of Glen Retreat Mandarins, as immature fruit spoils the sale of the good article.

If the orchard has not been cleaned up after the summer rains, do so now; and do any other odd jobs that may be required, such as mending fences, grubbing out dead or worthless trees, cleaning out drains, &c.

Strawberry planting may be continued, and where new orchards are to be planted continue to work the soil so as to get it into the best possible tilth.

### THE TROPICAL COAST DISTRICTS.

Clean up the orchards after the rainy season. Look out for scale insects, and cyanide or spray for same when necessary.

Go over the trees carefully, and when there is dead wood or water sprouts remove them. If bark fungus is showing, paint the affected branches with the



sulphur and lime wash. Clean up bananas, pineapples, and other fruits, as after the end of the month it is probable that there will not be any great rainfall, so that it is advisable to keep the ground well cultivated and free from weeds, so as to retain in the soil the moisture required for the trees' use during the winter months. Keep bananas netted; destroy guavas wherever found.

#### THE SOUTHERN AND CENTRAL TABLELANDS.

If the orchards and vineyards have not already been cleaned up, do so. Cultivate or plough the orchard, so as to get the surface soil into good tilth, so that it can absorb and retain any rain that falls, as, even though the trees will simply be hardening off their summer's growth of wood, it is not advisable to let the ground dry out. When citrus fruits are grown, attend to them in the manner recommended for the Southern Coast Districts; and when grown in the dry parts, keep the land in a state of good cultivation. Should the trees require it, a light watering may be given. Do not irrigate vines; let them ripen off their wood.

---

### Farm and Garden Notes for April.

FIELD.—The wheat land should now be ready for sowing the early wheats, and that which has not been prepared should be ploughed without delay, April, May, and June at latest being the months for sowing. The main potato crop, planted in February and March, will now be ready for a first or second hilling up. The last of the maize crop will now have been got in. Where cotton is grown, the pods will now be opening, and advantage should be taken of dry weather to get on with the picking as quickly as possible. Picking should not be begun until the night dew has evaporated nor during rain. Sorghum seed will be ripe. Tobacco also will be ripening, and either the leaves or the whole plant harvested. Lucerne may be sown, as the growth of weeds has now slackened off, but the ground must be thoroughly prepared and cleaned. Sow oats, barley, rye, wheat, mangolds, and Swede turnips. Plant out paspalum roots. Seed wheat of whatever variety soever should be dipped in a solution of sulphate of copper (bluestone) in the proportion of 1 lb. of sulphate to 24 gallons of water. The seed may also be treated with hot water by plunging it in a bag into hot water at 120 degrees Fahr. for a minute or two, and then into water heated to 135 degrees Fahr. Allow it to remain in this for ten minutes, moving it about all the time. Then plunge the seed into cold water and spread out to dry. This plan is useful in districts where bluestone may not be obtainable. Another safeguard against bunt, smut, black and red rust is to treat the seed with formalin at the rate of 1 lb. of formalin to 40 gallons of water. Schering's formalin costs about 2s. 10d. per lb., and is sold in bottles. It is colourless and poisonous, and should be kept where no children or persons ignorant of its nature can have a chance of obtaining it. To treat the seed, spread it on a wooden floor and sprinkle the solution over it, turning the grain over and over until the whole is thoroughly wetted. Then spread it out to dry, when it will be ready for sowing. Instead of sprinkling, dipping may be resorted to. A bushel or so of seed is placed in a bag and dipped in the solution. During five minutes the bag is plunged in and out, and then the seed is turned out to dry. Formalin is less injurious to the grain than bluestone, but, while the latter can be used over and over again, formalin becomes exhausted. It therefore follows that only the amount required for immediate

use for sprinkling should be prepared. Do not sow wheat too thickly. Half a bushel to the acre is sufficient—more on poor land and less on rich soils. On light sandy soil the wheat should be rolled. On sticky land it should only be rolled when the land is dry, otherwise it will cake, and must be harrowed again after rolling. When the wheat is 6 in. high go over it with light harrows. If the autumn and winter should prove mild and the wheat should lodge, it should be kept in check by feeding it off with sheep.

KITCHEN GARDEN.—Hoe continually among the crops to keep them clean, and have beds well dug and manured, as recommended last month, for transplanting the various vegetables now coming on. Thin out all crops which are overcrowded. Divide and plant out pot-herbs, giving a little water if required till established. Sow broad beans, peas, onions, radish, mustard and cress, and all vegetable seeds generally except cucumbers. Early celery should be earthed up in dry weather, taking care that no soil gets between the leaves. Transplant cauliflowers and cabbages, and keep on hand a supply of tobacco waste, preferably in the form of powder. A ring of this round the plants will effectually keep off slugs.

FLOWER GARDEN.—The operations this month will depend greatly on the weather. If wet, both planting and transplanting may be done at the same time. Camellias, gardenias, &c., may be removed with safety. Plant out all soft-wooded plants such as verbenas, petunias, penstemons, &c. Sow annuals, as carnations, pansy, mignonette, daisy, snapdragon, dianthus, stocks, candy-tuft, phlox, sweet peas, &c. Those already up must be pricked out into other beds or into their permanent positions. Growth just now will not be too luxuriant, and shrubs and creepers may be shortened back. Always dig the flower beds rough at first, then apply manure, dig it in, and after this get the soil into fine tilth. Land on which you wish to raise really fine flowers should have a dressing of bonedust lightly turned in. Wood ashes also form an excellent dressing for the garden soil. Prune out roses. These may be planted out now with perfect success. Take up dahlia roots, and plant bulbs as recommended for March.

---





VOL. XXII., PART 4.

[APRIL, 1909.]

Registered at the General Post Office for Transmission by Post as a Newspaper.]

---



THE  
QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOL. XXII. PART 4.

---

APRIL.

---

By Authority:

BRISBANE: ANTHONY JAMES CUMMING, GOVERNMENT PRINTER.

1909.



## CONTENTS.

AGRICULTURE—							PAGE.
State Farm, Roma.—Report on Silage Crops—Spring Sowings							175
Wheat-growing on the Coast Lands							176
Exhausted Soils							177
Quantity of Seed Potatoes required to Plant an Acre of Land							179
Disc-harrowing Lucerne							179
To COMBAT THE COTTON BOLL-WORM							179
DAIRYING—							
The Dairy Herd—Queensland Agricultural College, Gatton							180
Manuring for Milk							180
Feed and the Richness of Milk							184
SEED ONIONS							184
POULTRY—							
To Cure Broodiness in Hens							185
HONEY PASTE FOR LABELS							185
THE ORCHARD—							
An Enormous Grape Vine							186
ENDURANCE OF PONIES							186
BOTANY—							
Contributions to the Flora of Queensland							F. M. Bailey, F.L.S. 187
HORTICULTURE—							
Flower Gardening, No. 15							The Editor 188
TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1909							193
STATISTICS—							
Commonwealth Meteorology							194
SCIENCE—							
Analyses of Ensilage							J. C. Brünnich 195
TROPICAL INDUSTRIES—							
Cocoanut Culture							196
New Fibre Plant (Pita del Opon)							201
FERTILISING SMALL GARDENS							201

## GENERAL NOTES—

Windmills	...	...	...	...	...	...	...	...	202
Dingo Trapping	..	...	...	...	...	...	...	...	202
Cure for Blight in Cattle		...	...	...	...	...	...	...	204
Frozen Pigs from China		...	...	...	...	...	...	...	205

## ANSWERS TO CORRESPONDENTS—

Tomato Beetles ... 205

## THE MARKETS—

Prices of Fruit—Turbot-street Markets	...	...	...	...	206
Southern Fruit Market	...	...	...	...	206
Prices of Farm Produce in the Brisbane Markets for March				...	207
Enoggera Saleyards	...	...	...	...	207

ORCHARD NOTES FOR MAY ... .. A. H. Benson, M.R.A.C. 208

FARM AND GARDEN NOTES FOR MAY . . . . . 210

PLANTING SEASONS, &c., IN DIFFERENT PARTS OF THE STATE OF  
QUEENSLAND ... .. 212

PLANTING SEASONS, &C., NORTHERN DISTRICTS (TROPICAL PRODUCTS) 216

LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES ... .. I.

DEPARTMENTAL ANNOUNCEMENTS ... .. VII.

DIRECTIONS FOR FORWARDING SPECIMENS . . . . . VIII.



NOTICE.

Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,  
to cover postage.

To all other persons the annual subscription will be 10s., which will include postage.

All remittances should be made by postal notes or money orders, but where they are unobtainable stamps will be accepted, though the Department accepts no responsibility for any loss due to the latter mode of remitting.

For your convenience an Order Form is attached. A cross on each side of the Order Form indicates to the recipient that his subscription is again due.

Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

ORDER FORM.

To the Under Secretary, Department of Agriculture  
and Stock, Brisbane.

For the enclosed\* ..... please  
forward me THE QUEENSLAND AGRICULTURAL  
JOURNAL for One Year.

Name.....

PLEASE WRITE PLAINLY. Address.....  
.....

Occupation.....

\* State amount according to above rate.

## Agriculture.

### ROMA STATE FARM.

#### REPORT ON SILAGE CROPS—SPRING SOWINGS.

The effects on the different crops of the phenomenal hot weather experienced in the latter part of December and the early part of January have furnished some valuable data towards ascertaining the most suitable kinds to grow for fodder purposes where such conditions are likely to eventuate.

The following were the varieties grown and observations made:—

**MAIZE.**—Sown 11th September. Plants through in eight to ten days, and grew rapidly until about the second week in November, when a short, hot, dry spell ensued. Beneficial rains followed, to which the crop responded quickly.

The heat wave experienced later completely ruined the crop, affecting it in the same manner as if it had been subjected to frost, the leaves being completely dried out, and so brittle as to be broken off by the wind. The cutting for silage purposes took place during the second week in January, the yield being estimated to be about  $3\frac{1}{2}$  tons to the acre. At this time the plants had become so dry as to necessitate the addition of water to the material as it was chaffed into the silo, in order to conserve properly. Not 1 per cent. of the plants showed signs of cobbing.

Another crop of maize, sown a month later on land which had been fallowed (worked) for the previous six months, gave no better results.

The benefit derived from sowing graded seed was one of the chief features of these experiments, three and a-half days being occupied in thinning out the first crop sown with ordinary grain, whilst no labour was expended in this manner on the second, which was grown from graded seed.

**SORGHUMS** (*Sorghum saccharatum*).—Sown 19th October. Fit for ensilage in about 11 weeks from sowing. This is rather a quick-growing variety. It was not visibly affected by hot weather, and produced a fair quantity of fodder and seed. Stalk fine and leafy. Yield, about 4 tons to the acre.

**EARLY AMBER CANE.**—Sown 19th October. Fit for silage purposes in about 10 weeks from sowing. This is perhaps the quickest-maturing variety grown here at present, and probably the most suitable, as it produces a heavy crop of fine fodder. Stalks thin and leafy. Grows quickly after cutting. Yield, about 5 tons to the acre. Was apparently unaffected by hot weather.

**KAFIR CORN** (Red and White).—Sown 19th October. Were fit for silage purposes in about 13 weeks from that date, and provided the heaviest yield of fodder, estimated at about 7 tons to the acre; showed very little distress during hot weather. The red variety is the most suitable one to grow, being much finer in the stalk, and producing more foliage than the white. The second growths of these are much heavier than those of any other previously mentioned crops.

**PLANTERS' FRIEND.**—Sown October. This is the slowest-maturing variety of sorghum grown, and is only now, 17 weeks from sowing, in fit condition for producing the best ensilage. This showed the effects of the hot weather more than any variety, being at a more susceptible stage, but when congenial conditions supervened it recovered wonderfully, and will yield when cut a much heavier crop of material than those mentioned. Though not as suitable for converting into dry fodder as *Sorghum saccharatum* or Early Amber Cane, it should prove more nutritious than either in the form of ensilage, on account of the heavy crop of seed it has set.



**COWPEAS.**—Sown 15th October. This crop for forage and other purposes is evidently one of the most suitable grown here at present, and has afforded heavy quantities of succulent vegetation under conditions which proved injurious to others. During the excessive hot weather, when all other crops were at a standstill, these plants grew rapidly, and the leaves did not even flag on the hottest day.

These have not yet been harvested, but the yield of green feed, which at present covers the ground in a solid mass to a depth of about 2 ft., is estimated at about 8 tons to the acre.

A sowing of this crop made last month for seed looks splendid.

It has been proved conclusively, both during this and last seasons, that cowpeas will grow on dirty ground, and eventually cover the area sown with them in such a manner as to prevent ordinary weeds from coming to maturity, and in this respect have proved very valuable in the eradication of couch grass here.

[The latter statement in the above report is well worth noting. A crop which will effect the eradication of couch grass must prove of great assistance to the farmer in many parts of the State. In the year 1903 we paid a visit to the old meatworks at Charleville, where Mr. Fesler, an enthusiastic market gardener, cultivated 6 acres entirely by hand. He was very much handicapped by the luxuriant growth of couch grass. Any crop which would have helped him in the laborious work of forking it out would have been of great assistance to him.—Ed. "Q.A.J."]

---

### WHEAT-GROWING ON THE COAST LANDS.

In the past wheat has been grown with success in various districts on the coast, as far north as Bundaberg, but for many years this branch of agriculture has been abandoned on the seaboard in favour of lucerne and other fodder crops, maize, potatoes, and fruit. There are certainly no great stretches of land suitable for wheat-growing in the coastal districts, such as can be found in the Darling Downs country and in the Maranoa districts and other inland regions as far west as Barcaldine and Longreach. The bulk of the alluvial lands and river flats will undoubtedly grow good crops of wheat; but wheat thus situated will be likely to suffer from floods, from excessive winter growth and consequent lodging, and from fungus diseases, especially rust. Hence it is obvious that such lands may be much more profitably employed in producing such crops as those above mentioned, particularly in connection with dairying and pig-breeding. On the other hand, for quite opposite reasons, the thin uplands, particularly those overlying at shallow depths, reefs of shale, ironstone, or sandstone are not and cannot profitably be made "wheat lands." Among these poorer soils, the very best for the purpose will be found in those overlying granitic rocks. All soils having at shallow depths a tenacious yellow and red streaked "spewey" subsoil may at a glance be rejected as worthless for the wheat plant. The question of the suitability of the subsoil for wheat, as for most other crops, may be easily determined by a simple operation: Sink a hole to a depth of 18 in. or 2 ft., or until the subsoil is well entered. If this hole remains partly filled with water after each rain, or until removed by evaporation, it will be a waste of labour and means to attempt to grow wheat in its vicinity.

Lying between the two extremes of good and bad land there are all along the coast of Southern Queensland areas of rolling, moderately fertile, brown and reddish loam and black soils which undoubtedly are capable, with suitable management, of great things in wheat-growing. Doubtless these lands would quickly break down under the perpetual wheat-cropping system.

so much in vogue on the Darling Downs wheat farms, and they would certainly not equal those lands in the average yield per acre; but the crop upon these easily worked soils would be made cheaper, or, rather, at a greater profit to the grower. Nearly all who have attempted wheat-growing along the coast have made the mistake of using low-lying alluvial lands, which much better suit the requirements of coarse-growing lucerne and maize than wheat.

Now, taking the class of coastal soils referred to above, it may be said that they are nearly always deficient in the element nitrogen and in organic matter in general. This is sufficiently explained by the abundant rains and fervid summer heats of the Queensland coast climate. The wheat-grower's efforts must, then, be in the direction of storing up and conserving in the soil, for the use of the future crop, these wanting yet most necessary ingredients. To this end the sod which covers the ground, and the droppings of animals which have grazed on it, will contribute in an important degree towards the support of the intended wheat crop. The land should be cleanly ploughed to the depth of about 5 in., the work being completed at least six weeks before the time of seeding. The second or principal plough follows the "skim coulter" plough, burying the sod to such a depth that it cannot sprout through, leaving a loose mellow surface over the field. Within a couple of weeks the land should receive a thorough harrowing, with subsequent workings by the scarifier to keep down the weeds and secure a good tilth. When the ground is ready it will be necessary to think of the most advantageous seeding time. This will naturally vary in different districts, but one thing is certain, and that is, that the early seeding time as practised on the Downs will not be advantageous. The great danger of early seeding in the coast districts of the State is likely to arise from the action of warm, wet, winter weather, inducing a too early rank growth of the wheat plant.

If the season holds warm and dropping, until, say, the middle of May, wheat-sowing should be deferred until that time, or even until the beginning of June. If, on the other hand, the autumn was cold, with scant rainfall, it would be well to sow as quickly as possible after the middle of April. Follow the sowing with harrowing sufficient to cover the seed, and roll afterwards always. That much neglected implement, the roller, is one of the most valuable of cultural implements. It does what no other implement can do. Besides consolidating and pressing the soil firmly about the seed, and pulverising lumps, it leaves the ground in the best possible condition for the passage of harvesting machinery. Of all farmers the wheat-grower can least afford to neglect its use. It is an undoubted fact that soil, however poor, with very few exceptions indeed, may, by draining, manuring, and those operations associated with high farming in general, be brought into a suitable condition for the production of good crops of wheat where the climate is not unfavourable.

---

#### EXHAUSTED SOILS.

In a publication issued last year by the Department of Agriculture and Stock, entitled "Elementary Lessons in Agriculture," there occurs in the 4th Lesson of the 2nd Book the following passage:—"In reality, there is no such thing as an exhausted soil. The plant food is there, but it is out of the reach of the roots of the plants, and requires to be brought up in some way or another to become available. Constant cropping has certainly removed the fertilising matter from the surface, and, such being the case, good crops cannot be produced, and, in this sense, the land is said to be exhausted." Now, the Bureau of Soils of the United States Department of Agriculture has put forth an entirely new theory on the subject of so-called exhausted soils. As a matter of fact the Bureau declares that a soil does not become



exhausted by constant cropping, that the mineral plant food is always there, being reproduced as fast as it is absorbed by the crops. The cause of the failure of the soil to produce good crops is the formation of some chemical poison when one kind of crop is being continually grown. This idea naturally causes one's mind to consider lucerne-sick and clover-sick soils as containing such poisonous elements. To obtain confirmation of the new theory, Professor Whitney made systematic experiments, of which the following is a summary:—

“In order to test the idea, and find out if we were safe in announcing such a fact as this, so revolutionary as regards our former ideas, the Bureau of Soils has had parties in all parts of the State equipped with the most sensible methods for making these determinations in the field. We have taken out of the soil its own moisture, and have actually found similar quantities of phosphates of potash, of nitrates, and of lime, in the sandy soils of our truck region, in the ‘worn out’ soils of Virginia, in the fertile limestone soils of Pennsylvania, and in the black prairie soils of the West.

“We then went into the question of how much plant food is necessary; how strong a concentration the solution must have to support a growth of plants, and I may tell you investigators are not able to say how small the amount of phosphoric acid or of potash in the solution must become, if other conditions be maintained perfectly, before the plant will suffer. Plants have an extraordinary power for absorbing material from solutions. Take the case of the seaweed, from which iodine is extracted. Sea water has so little iodine that, although we have an exceedingly delicate method for the detection of iodine, we cannot discover it, even if we concentrate the water to a very small part of the original bulk; but the seaweed can get it and store it up in its tissues from that very diluted solution.”

Other experiments were made, and all of them pointed to the same conclusion: The difference of yields between fertile and what was popularly regarded as “exhausted” soil was not due to a difference in the supply of available plant nutrients. The suspicion was born that the unproductiveness of so-called worn-out soils was due, not to the absence of anything necessary to the plant's growth, but to the presence of something deleterious to its growth.

Several experiments were begun to test this suspicion. It was found at the outset that young seedlings would grow better in pure water, containing no plant nutrients whatever, than in the extract of soil which, though unproductive, lacked in none of the nutrient substances. This result again forced the bureau back to the conclusion that the unproductivity of the soil was due to the presence of a poison. To determine whether the soil was poisoned, lampblack was mixed with soil extract and filtered off. Wheat seedlings planted in it then grew lustily, though in the same soil previously they had done nothing. Both their top and their root developments were improved astonishingly. The lampblack added no nutrient to the soil; its sole service was to disinfect.

That these poisons render the soil unproductive, or, to speak more accurately, prevent the full and healthy germination of a seed, the bureau found out, determined their qualities, and identified them. Tyrosin, which is a substance found in green manure, is the name of one of them, and cumarin that of another. It was found that pure water, when impregnated with tyrosin, even to the small degree of 50 parts to a million of water, killed wheat seedlings outright, and that they thrived in the ratio that the quantity of tyrosin was diminished.

The question whether the soil can be cleansed from these poisons in some other way than the use of fertilisers is answered by the American scientists in the affirmative. It can be met by a systematic rotation of crops, and this, they think, is the true remedy.

## QUANTITY OF SEED POTATOES REQUIRED TO PLANT AN ACRE OF LAND.

Those farmers who have been planting potatoes year after year do not require to be told how many hundredweights or tons they require to plant a given area, but there are many taking up farming nowadays for the first time, and not being brought up to the business, have very little, if any, idea of the quantities of any kind of seed required per acre for field crops. To such amateur farmers the following advice by "Garden and Field" will be acceptable:—

"The quantity required to plant an acre of land with potatoes is, of course, regulated by the size of sets and the distance apart they are planted. There is a great difference of opinion as to the size of sets to use. Generally, when potato-growers are discussing the size of sets to use, if they are asked what weight the sets should be they don't seem to know what is meant. One man says he prefers a good big set, another man prefers a small set—neither man seems to know the weight of the sets he is advocating. It will perhaps be a guide to some growers to know that a potato as large as an egg weighs as much as the egg, and an ordinary hen egg weighs 2 oz. Some growers consider a potato as large as a hen's egg will make two sets—this would be 1 oz. for each set. With potatoes planted 2 ft. from row to row and 1 ft. apart in the rows, it would take 21,780 sets, and the sets weighing 1 oz. each it would take 12 cwt. 0 qr. 17 lb. 4 oz. of seed to plant an acre; this is about the distance apart generally adopted in small gardens. On the farm potatoes would require to be planted about 2 ft. 6 in. by 1 ft.—this would take 9 cwt. 2 qr. 25 lb. of seed; with 1-oz. sets at 2 ft. 6 in. by 1 ft. 3 in. it takes nearly 8 cwt. of seed. The size of sets is one of the most important things the farmer that has to buy his seed has to consider. Seed potatoes the size of hen eggs are the most economical to buy; each potato will make two sets, and each set will grow as good a plant as a whole potato the size of an egg."

---

## DISC-HARROWING LUCERNE.

The farmers of the United States of America are perhaps the most consistent followers of the policy of loosening the top soil round lucerne at intervals in order to give it a fresh growth. At first it was done with the old-fashioned cutting implements, such as the common cultivator, but when the disc-harrow was invented the farmers saw in it a much more satisfactory implement for that purpose. Now, however, they have found an improved one of Australian origin, and have adapted it to their own implements. They weld a set of spikes to each disc of their harrows, so that the implement tears the ground instead of cutting it, and claim that the results are very much better than with the disc-harrows.

---

## TO COMBAT THE COTTON BOLL-WORM.

The Under Secretary for Agriculture and Stock has received from Messrs. Hemingway and Co., of Marsh Gate, London, a communication on the subject of the destruction of the boll-worm, which is occasionally very troublesome in the cotton fields here, as in other cotton-growing countries. They recommend the use of "London Purple," which is already extensively used for the destruction of fruits pests; in fact, it has been employed for this purpose for the past thirty years in Australia and in the United States to fight the cotton boll-worm, with eminent success. According to the circulars sent, the preparation is not expensive, ranging from 5½d. to 7½d. per lb., according to the manner in which it is packed for export.



Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF FEBRUARY, 1909.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	College Lass	Ayrshire ...	31 Jan., 1909	1,128	4·0	50·53	
2	Whitefoot...	Holstein-Devon	20 Oct., 1908	754	3·9	32·81	
3	Glen ...	Grade Guernsey	29 Jan., 1909	833	3·5	32·32	
4	Gem ...	Grade Shorthorn	13 Dec., 1908	658	4·3	31·73	
5	Conceit ...	Ayrshire ...	22 Dec. „	663	4·0	29·50	
6	Dot ...	Shorthorn ...	12 Nov. „	689	3·8	29·17	
7	Nancy ..	Grade Shorthorn	7 May „	663	3·8	28·07	
8	No. 112 ...	Grade Guernsey	24 Nov. „	672	3·7	27·66	
9	Laura ...	Ayrshire ...	16 Nov. „	682	3·6	27·28	
10	Lady Ring	Guernsey ...	26 Jan., 1909	552	4·4	27·26	
11	Careless ...	Jersey ...	1 Nov., 1908	573	4·2	27·23	
12	Poppy ...	Grade Guernsey	10 Jan., 1909	721	3·4	27·13	
13	Len ...	Ayrshire ...	6 May, 1908	656	3·7	26·99	
14	Dora ...	Shorthorn ...	18 Nov. „	618	3·9	26·88	
15	Maud II. ...	„ ...	16 Jan., 1909	577	4·0	25·78	
16	Graceful ...	Grade Shorthorn	10 Dec., 1908	469	4·8	25·36	
17	Blackbird ...	Grade Holstein...	4 Feb., 1909	732	3·0	24·09	
18	Daisy ...	Holstein ...	24 Oct., 1908	720	3·0	23·70	
19	Friz ...	Shorthorn ...	4 Feb., 1909	649	3·3	23·65	
20	Eve ...	Jersey ...	16 Oct., 1908	525	4·0	23·46	
21	Nell ...	Shorthorn ...	10 Feb., 1909	452	4·6	23·38	
22	Comet ...	Holstein ..	22 Nov., 1908	584	3·6	23·36	
23	No. 1 ...	Shorthorn ...	1 Nov. „	615	3·4	23·13	
24	Grace ...	Grade Shorthorn	30 May „	534	3·3	23·11	
25	Lowlā ...	Ayrshire ...	8 Dec. „	606	3·4	22·80	
26	Peewee ...	Grade Holstein ..	20 May „	500	4·0	22·35	
27	Carrie ...	Jersey ...	4 April „	417	4·6	21·57	
28	Ethel ...	Holstein ...	3 Sept. „	519	3·7	21·36	
29	Wonder ...	Grade Shorthorn	2 Dec. „	548	3·4	20·62	
30	Nita ...	„ „	23 Nov. „	525	3·5	20·37	

The herd was fed from the 13th to 27th with green maize (chaffed) at the rate of 30 lb. per cow daily, and allowed to graze on the natural grasses.

MANURING FOR MILK.

A unique and valuable experiment in Taranaki, New Zealand, has been carried out with a view to determining in how far, if at all, the milk yield is affected by judicious top-dressing of pasture land.

The experiment was designed by J. Montgomerie Hatterick, F.H.A.S., N.D.A., of Sydney, N.S.W., and carried out by H. G. Sergel, of Eltham. The "New Zealand Farmer," of July, 1908, gives a full account of the experiment, and publishes the complete returns for the whole period of twelve weeks in tabular form, which we here summarise. The article has just reached us in pamphlet form, and affords most instructive reading. Mr. Hatterick says:—

The rapid development of the practice of top-dressing pasture lands in New Zealand has been quite an outstanding feature in the agricultural progress of the Dominion during the last five years, and particularly has this been

the case in the Auckland Province. There, more than anywhere else, does the soil respond to manures, and many numerous instances are cited of the phenomenal increases which have been brought about in the stock-carrying capacity of land and in the quantities of milk produced simply by judicious manuring. So obvious, in fact, are the resulting benefits that no special proof is needful to convince the average Waikato farmer of the value of top-dressing.

This is not, however, the case in other districts, and particularly in Taranaki, where the farmers have been slow to adopt an innovation without convincing proof of its advisability. The soils of Taranaki are in general rich; most of the province was covered with heavy bush so recently as twenty years ago; and so fertile is the land naturally that when the bush was cleared, and "a good burn" secured, no difficulty was experienced in establishing splendid pastures on the cleared lands. The climate of Taranaki is specially favourable to the growth of grass, and at first sight any artificial aid would appear superfluous, so luxuriant is the herbage in favourable seasons. This very fact has also contributed to prevent the rapid extension of the practice of top-dressing, because where grass is everywhere abundant it is difficult to detect any marked improvement of the manured area by inspection alone.

As will be shown later, however,

*Grass is not always Feed,*

and a pasture may be innutritious, although grass is abundant.

The object of the experiment, with which the present report deals, was to determine in how far, if at all, the milk yield was affected by judicious top-dressing. That the quality of the food has a most powerful influence upon the milk yield of dairy cattle has already been abundantly proved by numerous reliable experiments in the house-feeding of milch cows. That judicious manuring also had a great effect upon the quality of the feed in pastures is accepted by most intelligent practical men, but up to now there has been, so far as the writer is aware, no experimental proof of the fact, and the experiment is, therefore, absolutely unique and worthy of quite special study by all who take an interest in our agricultural progress.

The object of the experiment being to determine in how far the milk yield was effected by the manurial treatment of the pasture, it was necessary to compare for a fairly long period the yields of milk from equal areas of land, manured and unmanured. For this purpose, a block of fairly uniform land of first-class quality (its present value is about £33 per acre) was selected in a conveniently situated paddock, and two plots, each 4 acres in area, carefully measured off side by side. In July, 1907, the following mixture was applied to plot 1:—

1 cwt. 30 per cent. potash manure and  
3 cwt. basic slag per acre.

No special precautions were taken to prevent stock from grazing over both plots throughout the early spring, and it was only on 8th October that the plots were fenced off and stock excluded. A week later (on 15th October) four cows of the ordinary type met with in Taranaki, but known to be of specially quiet temperament, were selected from the herd, and of these two were placed on each plot. The cows were known to be, when treated alike, all about equal in milk-yielding power. Commencing on 15th October, the milk of each cow was carefully weighed morning and evening for six weeks. At the end of that period the cows were interchanged, so that those which had been on the manured land were then transferred to the unmanured land, and *vice versa*. The yields were then recorded in the same manner as before for a further period of six weeks. By interchanging the cows in this manner, it was hoped to eliminate any difference which might be due to the individuality of one or other of the two lots of cows.



In considering these returns, it is important to note that, as Mr. Sergel reports, the area assumed as sufficient to graze two cows—namely, 4 acres—had been very much overestimated, and consequently the grass in both plots gained on the cows very rapidly, so much so that the manured portion had the appearance of a hay field. The striking superiority of the manured plot is, therefore, all the more significant, in view of the fact that both lots of cows had apparently throughout a superabundance of feed.

Bearing this fact carefully in mind, it is seen from the complete table of results that the net total increase was  $258\frac{1}{2}$  lb. of milk from 4 acres of land in twelve weeks, equivalent to  $64\frac{1}{2}$  lb. of milk per acre in twelve weeks.

Assuming that the ratio of manured to unmanured would have remained the same throughout a milking season of thirty-eight weeks, as it was during the twelve weeks recorded, the difference would be, in round numbers, 204 lb. increased yield of milk per acre—*i.e.*, practically  $20\frac{1}{2}$  gallons. This at the price actually paid by the factory to which the milk was sent—*viz.*,  $4\frac{1}{10}$ d. per gallon (which is calculated from the average butter-fat content of milk from the whole herd on Mr. Sergel's farm, and the price paid by the factory for the same)—represents an increased monetary return of 7s. per acre in the first season. The manures cost on the farm 24s. per acre, and as there is no doubt that the heavy dressing given will remain effective for four or, perhaps, five years, it is permissible to spread the cost over four years at any rate, in which case we have already a profit of 1s. per acre in the first year.

This, however, by no means represents the actual gain, or the increase which would be obtained in ordinary practice. In all the "Manuring for Mutton" experiments which have been carried out during the past ten years, it has been usual to stock each plot to its full carrying capacity. This was not done in the present trial, and Mr. Sergel estimated that the manured plot would easily have carried one cow more than the unmanured, and it is intended in future work to adopt the plan of putting on each plot as many cows as it will carry.

Meantime, a better idea of the value of top-dressing with potash and slag may be formed if the yields from the cows on the manured land be compared with those from the animals on the unmanured portion, in order to arrive at the average daily gain per cow from top-dressing. Calculation from the table of complete returns shows:—

(a) Average daily yield per cow on manured land	...	43.5 lb.
(b) Do., unmanured land	... ..	41.9 "
Average daily increase per cow		1.6 "

If we assume, as before, that the ratio of manured to unmanured would remain throughout a milking season of thirty-eight weeks, and the evidence of the figures goes to show that this is within the mark, because there is a decidedly quicker falling off in the cows on the unmanured land towards the end of the test, we now find that this increase amounts to  $42\frac{1}{2}$  gallons per cow for the season. This quantity at the same price as before ( $4\frac{1}{10}$ d. per gallon) is worth 14s. 6d., which sum represents the increased earnings per cow for the season. So much for the actual financial results.

One or two points in the table of figures are of interest. Firstly, it will be noticed, on comparing the weekly returns, that after the fourth week the cows on the unmanured plot fall off very rapidly, while those on the other plot keep up the quantity until the end of their stay there.

Secondly, the rapid response of cows Nos. 3 and 4, when transferred from unmanured to manured land. In their last week on the unmanured land cows Nos. 3 and 4 gave 50 lb. of milk less than cows Nos. 1 and 2, whereas after they had been six weeks on the manured land, they were giving 30 lb. milk

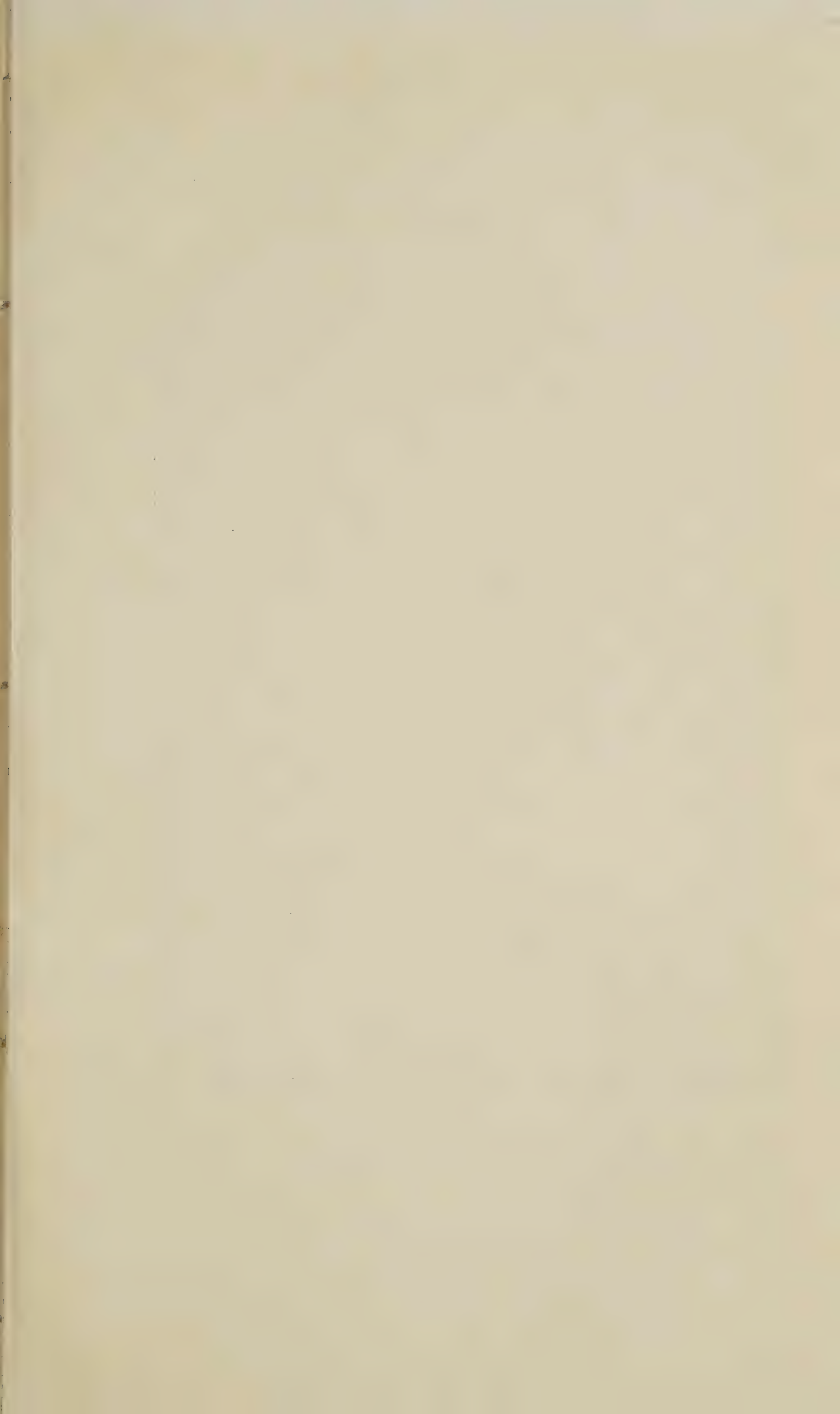
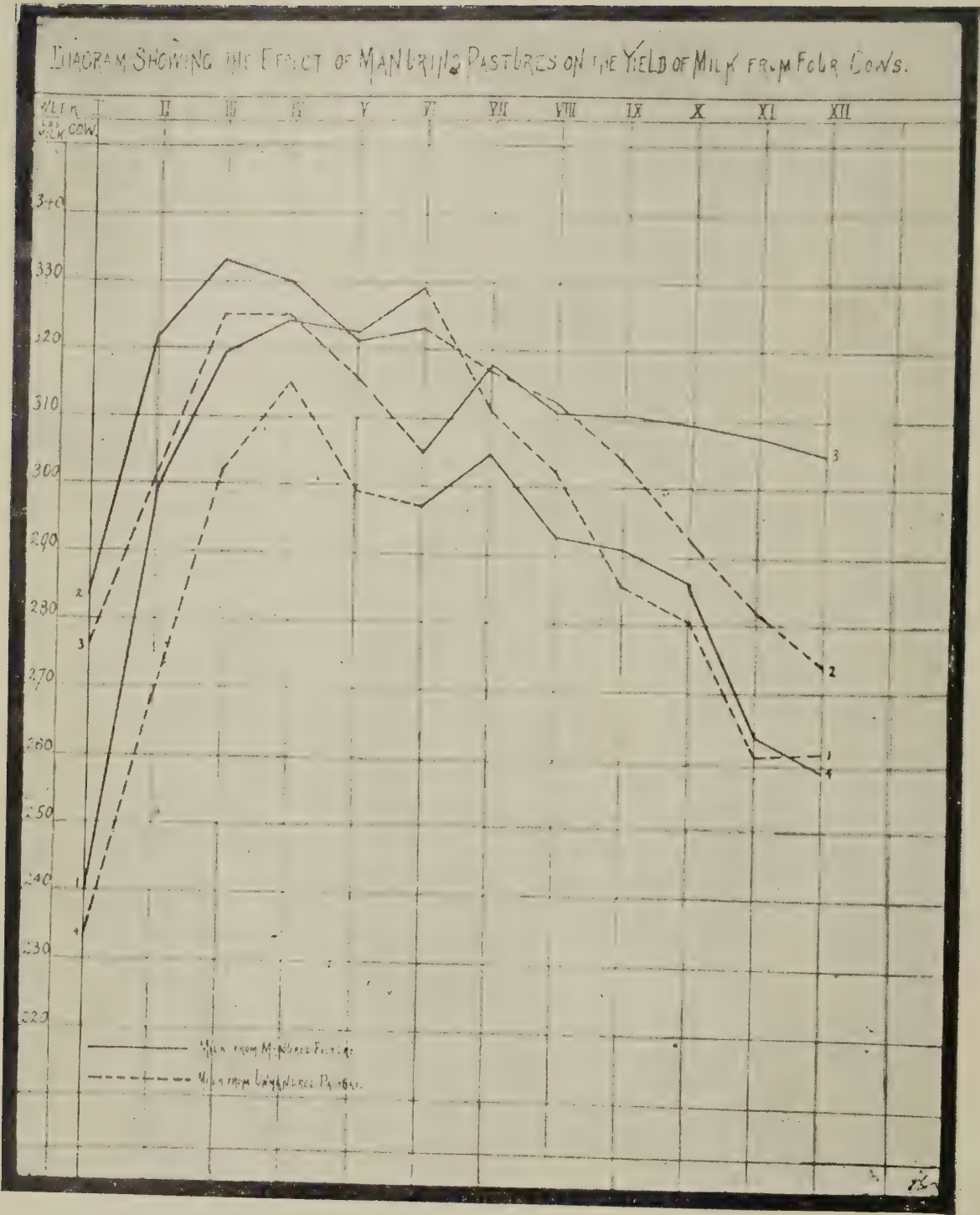




Plate XXV.



more than Nos. 1 and 2. It is important to mention that No. 4 was towards the end of the experiment unwell, otherwise the difference in the yields would have been greater. The tables show that No. 4 commenced to fall off about the beginning of the fifth week of the trial, and from that point onwards fell off steadily until the twelfth week, in spite of her transference at the end of the sixth week to the nutritive manured ground.

If No. 3 alone be compared with Nos. 1 and 2, it will be seen that whereas, at the end of the first six weeks she was giving 34 lb. of milk less than Nos. 1 and 2 respectively, on the manured ground, after a lapse of six weeks, she was giving 8 lb. and 6 lb. more than Nos. 1 and 2 respectively.

At the end of twelve weeks Mr. Sergel, on his own initiative, made an attempt to investigate the effects of the manuring upon the butter-fat content of the milk from manured *v.* unmanured grass, and he has reported on this test as follows:—

“A further experiment was carried for six days longer, to ascertain what difference there might be in butter-fat between grazing in the two paddocks, the cows being changed on the third day. It was found on the third day Nos. 3 and 4 on the manured piece gave 3.00 lb. of butter-fat, and Nos. 1 and 2, on the unmanured, gave 2.45 lb. of butter-fat, a difference of .55 lb. At the end of the second period Nos. 3 and 4 on the unmanured gave 2.73 lb., and the others 2.52 lb., a difference of .21 lb., or a net difference of .33 lb. I may say that at the end of the first period Nos. 1 and 2 gave 5 lb. weight of milk less than Nos. 3 and 4; and at the end of the second period, after being on the manured ground, gave 5 lb. of milk more, a difference of 10 lb. in three days.” (Note.—The quantities of butter-fat were determined from the creamery test of a composite sample of the milk from both cows on each plot, and the actual butter-fat produced per diem by the two cows calculated from the quantity of milk produced and the percentage of butter-fat it contained.)

This superiority in butter-fat of milk from cows grazed on top-dressed land is alone sufficient to warrant the expenditure, and forms one of the most favourable arguments in favour of top-dressing.

In conclusion, when one considers the fact that the experiment was conducted in one of the best dairying districts of Taranaki, on land which grows in an ordinary season abundance of grass, with ordinary cows not specially selected, and finally, but most important, that the number of cows was insufficient to keep down the grass on the plots, and that the manured plot could easily have carried one, and at times two, cows more, one realises what a convincing proof of the value of top-dressing this experiment affords.

It was quality of feed alone which produced the difference in favour of the manures, and if the extra quantity of feed produced has been fully utilised the profits would have been enormous.

The application of the mixture used in this experiment, namely—1 cwt. 30 per cent. potash manure and 3 cwt. basic slag per acre—cannot be too strongly recommended. The potash originally present in the lands on which dairying is practised soon becomes exhausted, and must be replaced, as it is essential to the growth of clover and grasses, but particularly the former, while phosphates, always more or less deficient, are supplied in the slag.

The proper time to apply the mixture is June or July, the earlier the better, but good results will attend the application any time from March to September.

The diagram shows more clearly than the tabulated return the superiority of cows Nos. 1 and 2 while on the manured land during the first six weeks of the trial. Cow No. 3, it will be observed from the yields during the first three weeks, is a better cow than No. 1; but after that time the effects of the feeding on cow No. 1 make themselves felt, and from that time until the end of the sixth week both cows on the manured land are superior to the other pair on



the unmanured land. The sudden falling-off in yield of all cows between the fourth and fifth weeks is due to the fact that at this time the period of oestrus occurred with all of them. From the sixth week, at which time the cows were interchanged, until the eighth, the unmanured land is slightly superior to the manured; but the effects of the change from poor to rich feeding, and *vice versa*, are very marked between weeks six and seven. From week eight until the end of the experiment the cows on manured land are again in the lead, and but for the fact that cow No. 4, which throughout gave by far the lowest yield, was during the last four weeks of the trial very unwell, the superiority of the manured land would have been still more marked.

#### MILK YIELDS.

The milk yields recorded for morning and evening for the first period of six weeks from the manured plot were:—1st week, 523 lb.; 2nd week, 621 lb.; 3rd week, 652½ lb.; 4th week, 654½ lb.; 5th week, 643½ lb.; 6th week, 652 lb.

Cows grazed on the unmanured pasture land yielded:—1st week, 509 lb.; 2nd week, 570 lb.; 3rd week, 626½ lb.; 4th week, 640 lb.; 5th week, 615½ lb.; 6th week, 602 lb.

These results show an increase in milk yield from the manured plot per week of 14 lb., 51 lb., 26 lb., 14½ lb., 28 lb., 50 lb. respectively, or a total of 183½ lb. for the first period of six weeks.

The second period shows a gain from the manured plot of 75 lb. over the yield from the unmanured pasture, the total gain from the manured plots for the whole period of twelve weeks was 258½ lb.

---

#### FEED AND THE RICHNESS OF MILK.

Many dairymen hold fast to the belief that the richness of milk is increased by certain foodstuffs. That this is not so has been demonstrated by frequent experiments. Much may be done to influence the quantity of milk that any certain cow will give, but very little effect on the richness of it can be obtained by varying the feeding. The "British Live Stock Journal" says, on this point:—The question has often arisen as to whether or not feeding meal will cause a cow to give milk with a larger percentage of butter fat. Once we heard one of the best known dairy farmers state that the feeding of meal would cause a cow to give richer milk; yet the general trend of experimental work shows that meal has little or no effect upon the percentage of fat in milk, but does tend to increase the flow or quantity of milk, especially where cows are not being fed to their capacity. There are a few apparent exceptions to the rule, but they only serve to emphasise the law that cows govern the quality or percentage of fat in milk, and feed and cow govern the quantity.

---

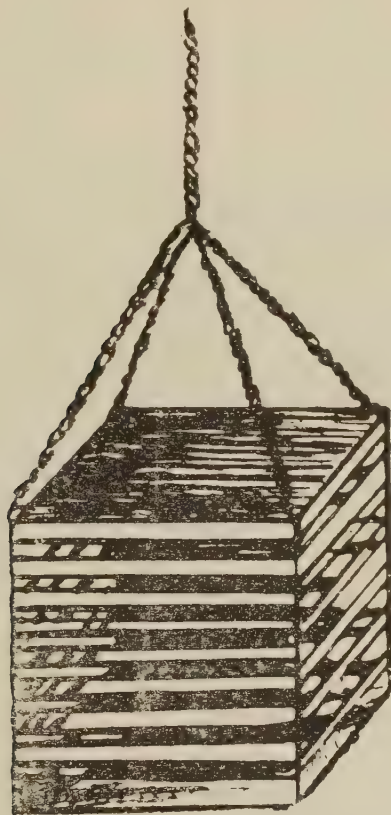
#### SEED ONIONS.

A method of treating large onions intended for seeding purposes is, to us, a novel one, but is recommended by a contributor to the "Gardeners' Chronicle." About midwinter select your bulbs, and plant them in pots, the smallest pots possible; those having a diameter of 5 in. or 6 in. will generally suffice. Three parts of each bulb should be left uncovered, using only just sufficient soil for the bulbs to root into. Place them in a cool house or cold frame; keep them moderately dry, and do not allow the young growth to become drawn. Plant the bulbs out in an open, sunny, position, early in the spring, and afford them a slight protection against frosts and cold winds until the weather is warmer. The bulbs should be planted three-parts their depth.

## Poultry.

### TO CURE BROODINESS IN HENS.

A correspondent lately writes that she had tried various means to overcome the desire of hens to sit, but with very little effect. We suggested a trial of the swinging coop, which, with us, answered the purpose to perfection. The suggestion was adopted, and now the lady has no further trouble. The coop is about 2 ft. square and 2 ft. high. The sides are made of thin battens



about 2 in. apart, so that the enclosed hen enjoys no peaceful privacy, and as the other fowls are fed close to the hanging coop, the noise and disturbance, combined with the constant swaying of her prison house, soon dispel all desire on the part of the hen to sit. The coop should be swung by a cord from a beam in the yard or poultry house, the yard for preference.

---

### HONEY PASTE FOR LABELS.

It frequently happens that small labels on tins fail to adhere when dry. To completely overcome the difficulty, an American bee-keeper, who tried all kinds of paste for sticking labels on tin cans and buckets, conceived the idea of mixing honey with the paste, and this proved a perfect success, the labels sticking tightly to the cans after drying. To make the paste, mix dextrine and vinegar to the consistency to suit, then add about 2 oz. of honey to the pint of paste. Don't make the mistake of putting too much honey in, or the labels will have a greasy appearance, and will not dry right. It requires more honey in a dry atmosphere than in a wet one. Such paste will keep in either a warm or cold climate. Other pastes might do if a label is used which will go clear around the tin and overlap a little, but they will not hold a small label.



## The Orchard.

### AN ENORMOUS GRAPE VINE.

The Year-Book of the United States Department of Agriculture for 1894 states that there is now standing in California a vine which is considered the largest in the world. It was planted in 1842 by a Spanish woman. Beneath its spreading branches, which cover nearly half an acre, 800 persons could find protection from the sun's heat. The first election in Santa Barbara County, under American rule, was held beneath its ripening fruit. The vine is of the Mission variety. In 1893 it bore 8 tons of grapes, and in 1895 over 10 tons. The trunk of this vine is 7 ft. 8 in. in circumference. The celebrated vine in the conservatory at Hampton Court, England, planted in 1769, had, in 1830, a stem 13 in. in girth, and a principal branch 114 ft. in length, the whole vine occupying more than 160 sq. yds. In one year it produced 2,200 bunches of fruit, weighing, on an average, 1 lb.—in all, about 1 ton of fruit.

It is difficult to accurately estimate the age of vines by the usual method of counting the rings, because the yearly growth is not distinctly marked. Some maintain that the vine equals, and even surpasses, the oak in point of longevity. Even in America it has been impossible to ascertain the age that planted vines will attain, and the time that has elapsed since its discovery would not be sufficient had the experiment been begun when Columbus landed in 1492.

Pliny mentions a vine 600 years old. Miller tells us that some of the vineyards of Italy held good for 300 years, and that vines 100 years old were accounted as young. It was recently stated that there are still vines growing which were planted by the poet Horace on his farm. Some of the vines of Burgundy, Professor Bosc says, are more than 400 years old, and doubtless there are native American vines of much greater age. The writer of the article on the grape vine and its fruit in the Year-Book mentioned says that he never saw a vine amongst the endless numbers of natives that abound in the American forests that died from the effects of age.

---

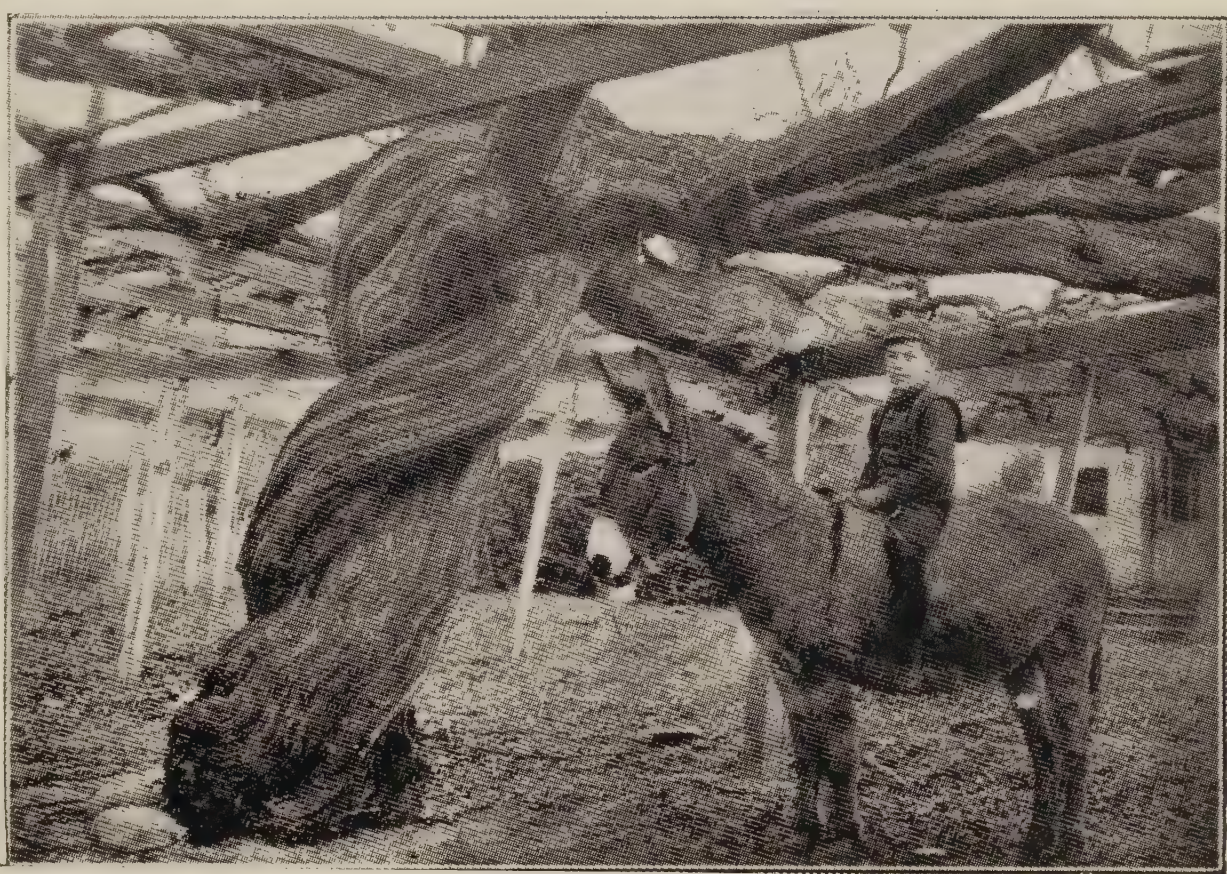
### ENDURANCE OF PONIES.

In 1859 (says the "Live Stock Journal"), when there was no railway line in America west of the Missouri River, a "pony express" for the carriage of letters was organised between St. Joseph, the railway terminus, and San Francisco, a distance of 2,000 miles. The country to be traversed was full of marauding Indians, so the express riders were small and active men, picked for their courage as well as for horsemanship and horsemastery. Five hundred ponies, bronchos, Indian, and "cayeuse," and eighty men, who had passed a riding test by travelling 100 miles at a stretch, were engaged. Each rider had from six to ten remounts, each awaiting him at appointed stages, and he rode from 60 to 80 miles a day—or night—as the nature of the country allowed. When the Indians were on the warpath the express travelled at night; Indian superstitions forbidding the braves to venture abroad in the dark, night travel was safe in the most disturbed districts.

"Buffalo Bill" was one of these express riders. He once rode 384 miles without rest or stop, except a halt of two minutes when changing ponies, which he did thirty-six times on the journey; he made the journey at an average pace of 16 miles an hour. Another rider named Haslam rode 264 miles at a stretch with only seven changes; one carried him 75 miles. Another rider named Moore rode 280 miles in 22 hours. How many ponies he used is not recorded.



*Plate XXVI.*



LARGEST GRAPE VINE IN THE WORLD.





## Botany.

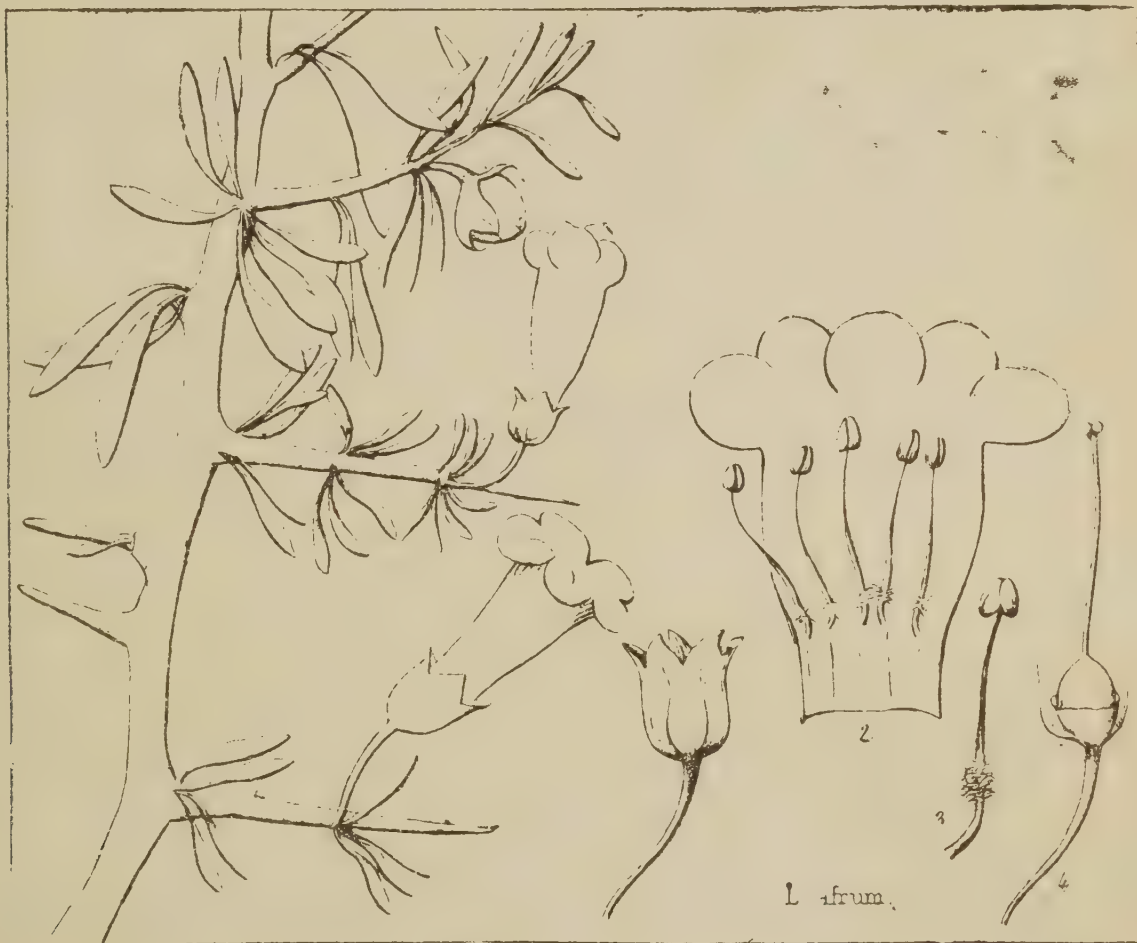
### CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By F. MANSON BAILEY, F.L.S., Colonial Botanist.

#### Order SOLANACEÆ. (THE NIGHTSHADE FAMILY.)

##### TRIBE ATROPEÆ.

*Lycium afrum*, Linn. The Caffir-thorn or African Boxthorn. A fiercely spiny shrub often utilised for hedges, but in some localities it has become quite a pest both in the pasture and cultivation paddock. The shrub is almost ever-green, attains a height of 5 to 6 ft.; leaves usually in clusters, linear-spathulate from  $\frac{1}{2}$  in. to more than 1 in. long, fleshy, somewhat hoary. Flowers almost axillary, drooping; calyx glabrous except the margin, rather large, bell-shaped, 5-toothed at length 2 or 3 fid. Corolla funnel-shaped or nearly bell-shaped,



*Lycium afrum.*

lobes 5, rounded, short and reflexed, dark-coloured. Stamens 5, hairy at or near the base, not longer than the tube. Style slightly longer than the stamens; stigma shortly 2-lobed. Berry globose, violaceous.

The genus contains about 70 species, natives of warm regions. Birds and other animals eat the berries, and by this means the plant is spread far and wide over the land, to the detriment of those of a more desirable character.

The above diagram is from Miers' Illustrations, ii.



# Horticulture

## FLOWER GARDENING, No. 15.

### PLANTS SUITABLE FOR IN AND OUT DOOR CULTURE.

By THE EDITOR.

#### ORNAMENTAL SHRUBS AND SHRUB-LIKE PLANTS.

##### EUPHORBIA (Crown of Thorns).

A curious and beautiful family of thorny plants, of dwarf habit, bearing trusses of vermilion flowers. Amongst the best are:—*Eu. jaquiniflora*, a small shrub which, in blossom, is one of the most brilliantly beautiful pot-plants of the garden. It is a useful winter-flowering plant of easy culture, thriving in a compost of rich loam and peat, made porous by sharp sand and bone-dust. It produces a profusion of small, dazzling, vermilion flowers, from the extremity of, and all down its long, smooth, slender, twig-like stems. If, some time before blossoming, its stem be bent, and fastened down over the rim of the pot, young shoots will break forth, and enhance the beauty of the plant by the additional flowers they produce. After flowering, the stems may be cut in, and the cuttings, if put in a pot of sand, will take root in a short time. *Eu. Bojeri* is a cactus-like plant, always in blossoms. It thrives best in a mixture of brick rubbish, leaf mould, and charcoal. *Eu. splendens* and *Eu. heterophylla* are also very beautiful.

##### CLERODENDRON.

A genus which comprises some of the most beautiful plants with which our gardens are adorned. Nothing can possibly surpass the loveliness of some of the species. Some occasionally yield seed, and all may be propagated without difficulty by cuttings, or from offsets or suckers, which most species send up abundantly. Flowers are produced from the top of the season's shoots, therefore, cut away wood of the previous season to within two or three buds of the base. To grow them well, much heat and moisture are necessary, but they do well in a lower temperature in winter.

##### VARIETIES.

*C. fragrans*: Flowers very double, like little roses; white, tinged with pink, of exquisitely delicate fragrance, borne in large compact heads. In favourable situations it does well out of doors. *C. odoratum*: Flowers of a pretty pale-blue, sweet scented. *C. Thomsonii* is a most beautiful climbing plant, which bears large corymbs of flowers, with white calyx and corolla with purple tube, and deep-crimson limb, succeeded by purple berries of the size of a pea.

##### BAUHINIA.

All the Bauhinias are remarkable for the peculiar form of their leaves, which are composed of two oval leaflets, laid side by side, and having their edges near the base united. In consequence of this twin-like union, the genus has been fancifully named after the two brothers Bauhin. They all bear seed, from which they are easily propagated.

##### VARIETIES.

There is a very extensive variety of this genus of shrubs and trees, a few of which can only be noted.

*B. purpurea*: A large, stout tree, effective in any garden large enough to display its handsome foliage and large, deep, rose-coloured flowers. *B.*

*triandra* bears large white flowers, as does *B. alba*. *B.* (so-called) *scandens* is a very beautiful variety, of wide-spreading habit. It bears a vast profusion of lovely white flowers with a pink blush. I have trained this plant for 50 ft. on either side of the stem. After blooming, the masses of seed pods have a rather pleasing effect until they change their russet for a black colour when ripe.

#### ALLAMANDA.

A genus of flowering shrubs of extreme beauty; ornamental also for their foliage. Several species thrive well in this State. Some of them are scandent, and have been described under the head of "Climbers." They are dwarf, bright yellow-flowering shrubs.

#### VARIETIES.

*A. nerifolia*; *A. Chilsonii*; *A. Hendersonii*; *A. cathartica* is a superb plant, but of a rambling and scandent habit, with very large, pure, bright yellow flowers; *A. Schottii* is somewhat similar, but not scandent, whilst the outer part of the tube of the corolla is deeply marked with red. There is a splendid variety, *A. sp.*, which produces truly magnificent flowers, fully 5 in. across, of a bright yellow colour, with the throat coloured with faint streaks of chocolate; the large unexpanded flower buds of a deep chocolate colour.

#### OLEANDER (*Nerium*).

*Nerium odorum* is a large, spreading shrub, to be seen in most Queensland gardens. It throws up from the ground numerous rod-like stems, upon the summit of which is borne its foliage of narrow, lanceolate leaves, surmounted by a profusion of bright rose, crimson, or white flowers. Propagated easily by layers or by division. It also yields seed abundantly. Other varieties are—*N. album*; *N. grandiflora*; *Mlle. Dubois*; *N. punctatum*; *N. rosea*; and *N. splendens variegatum*.

#### RONDELETIA.

Splendid ornamental flowering shrubs of great beauty; evergreen. They thrive well in light fertile loam, preferring a mild climate and shelter.

#### VARIETIES.

*R. speciosa* produces flowers of a rich vermilion, each with a deep-yellow eye; *R. punicea* is one of the handsomest ornaments of the garden. It bears throughout the warm weather, compact, moderate-sized trusses of beautiful orange-scarlet blossoms, somewhat like miniature heads of Auricula. Propagated by layers; bears seed scantily. *R. amœra*, flowers pink; *R. hybridum* and *R. versicolor*.

#### BROWNEA.

A genus of flowering shrubs of unrivalled splendour, bearing in character and foliage a strong general resemblance to Amherstia, which has been described as about the most beautiful object in the whole vegetable creation.

#### VARIETIES.

*B. Ariza*: A shrub or small tree which bears from the ends of its stems a cluster of blossoms of prodigious size, much resembling a bunch of Rhododendron flowers, of a fine deep rose colour, and of extraordinary beauty. *B. grandiceps*: The flowers are produced in a short spike, tier above tier, every day witnessing the expansion of a new tier above those of former days, till at last the whole mass becomes a globe of living and glowing crimson. *B. coccinea* bears smaller heads of flowers than the preceding, but more numerous, and of a bright scarlet colour, exceedingly gorgeous and dazzling. *B. Antiquiensis* is another splendid variety.

These are very easy of propagation by layering, but the young plants, when put out, require great care, or they are sure to die off.



## DURANTA.

*Duranta Plumieri*: A rather large, woody, thorny, but handsome spreading shrub, from 6 to 8 ft. high, with bright green foliage. Constantly in blossom, with numerous drooping bunches of bright azure-blue flowers, succeeded by pretty, orange-coloured berries of the size of a pea. It forms a very pretty garden hedge when properly trimmed. *D. Ellisii* has white flowers.

## MAGNOLIA.

All the Magnolias are beautiful flowering shrubs. *Magnolia grandiflora*, however, is an evergreen flowering tree, growing well everywhere to a height of 15 ft. and more. It is noted for its noble laurel-like foliage and its showy, large, white, powerfully fragrant flowers. It occasionally ripens seed of a brilliant red colour.

*M. anonæfolia* is a pretty, shiny-leaved shrub, having curious, pale, chocolate-coloured flowers with a powerful odour, somewhat resembling port wine.

*M. purpurea*, *M. conspicua*, and *M. bicolor* are deciduous, with large purple and white tulip-shaped flowers.

*M. fuscata* (the port wine flower) has purple flowers, also bears small pale-yellow or cream-coloured flowers of a deep, dull-crimson within, of the size and form of a pigeon's egg, exquisitely fragrant.

*M. pterocarpa* is a large handsome tree, bearing in unbounded profusion its large, pure white, globular-formed, finely fragrant flowers.

The Yulan Magnolia, known botanically as *M. conspicua* (mentioned above), is a hardy deciduous tree that grows 20 or more feet in height. The flowers are tulip-like, white, erect, fragrant, and produced before the leaves, early in Spring. *Magnolia Soulangeana* is a dwarfer kind, supposed to be a cross between *M. conspicua* and the small, hardy, Japanese species *M. obovata*. It is much like its Chinese parent, but has the dark-coloured, purple flowers of the Japanese species, grows more compactly, and blooms more freely. Its flowers are pearl-white inside, the purple only showing on the outer surface of the petals, and is deliciously scented.

Both of these shrubs are difficult to transplant, and should be purchased in the Spring as pot plants, then set where they are to grow, and well heeled in, watering and shading the first year or longer, until well established. In the South it is well to set the plants where they will receive the protection of a wall or building, the south or east side being preferable.

*Magnolia glauca* is a choice variety, but is rarely mentioned in nursery-men's catalogues.

## ALOYSIA (Verbena).

*Aloysia citriodora*: Lemon-scented verbena is well known for the fine fragrance of its leaves. It is a very common plant in our gardens. The flowers are insignificant. Propagated by laying down slips or cuttings in the cool weather. These readily strike in a pot filled with silver-sand and kept in a shady place.

## CERATOPETALUM (Christmas Bush).

The Christmas Bush is a gem for a large garden. The flowers, on their first appearance in October, are white; soon afterwards they change to pink, and as the petals decay the calyx gradually assumes a deep crimson. A variety of this tree, *C. Apetalon*, grows to a height of 100 ft., and *C. gumni-ferum* to 40 ft. Thus, although included here, they cannot be considered shrubs any more than *Magnolia pterocarpa*.

CODIÆUM, *syn.* CROTONS.

A genus of large shrubs, remarkable for their exceedingly ornamental foliage. Only under exceptional circumstances can these beautiful shrubs be grown in the Southern parts of Queensland, as they are essentially tropical

plants, requiring heat and moisture, and will not stand frost. Northwards from Rockhampton they thrive to perfection, particularly in the moist tropical climate at Cairns, Geraldton, and Cardwell. Given the right climate, they will grow in almost any situation, but thrive far best, and assume a much more beautiful character, when planted completely in the shade. They are easily propagated by cuttings. The species and varieties have become exceedingly numerous, and most of them are very beautiful. They thrive on a compost of three parts loam, one part peat, one part vegetable mould, and a good proportion of sharp sand. Grown in the greenhouse, they require a great deal of water, and occasionally a little liquid manure.

#### VARIETIES.

*C. pictum*: A bushy shrub, about 4 ft. high, leaves 6 to 7 in. long, the upper surface of a pure rich green, marbled with blotches of cream-colour, and, here and there, as it were, spotted and stained with blood; the under surface is entirely of a deep blood-colour, blotched with cream-colour. *C. latifolium*: A somewhat larger and more diffusely growing shrub than the last, but hardly less beautiful. The leaves are 1 ft. long, of a fine polished green, with the midrib of a pure cream-colour, and stained, here and there, with spots of the same colour; under surface of a pale green. *C. variegatum*: A large shrub 3 or 4 ft. high, leaves in the form of straps, 6 in. long, of a deep polished green, with cream-coloured, blood-stained midrib; under surface smeared seemingly with blood.

Some other good varieties are *C. maximum*, a superb plant, the finest of all, with leaves 1 ft. long, and 3 or 4 in. broad; bright golden yellow, with band of dark, olive-green on each side of the midrib.

*C. elegans*, *C. aucubæfolium*, *C. irregulare*, *C. undulatum*, *C. Veitchii*, &c.

#### Propagating Crotons.

Everybody understands the necessity of bottom heat in the rooting of hard-wooded plants such as crotons, but beginners may not be equally aware that in like degree heat is required to aid these plants in their endeavour to establish themselves in the soil in which they have been potted, when sufficiently rooted for that operation. Very often a great many cuttings that have been successfully rooted succumb very soon after being potted, when they are placed on a light, airy bench, where neither sufficient moisture nor bottom heat was available for the stimulation of increased root action and the retention of foliage. All tender plants, on being potted out of the cutting bench, are more likely to thrive without check if they are, when potted, placed over a gentle bottom heat, and sufficient shade afforded them until they are fairly well established. An ideal method of procedure is to put them in an enclosed glass case, or frame, until they are in such a condition that they will proceed to grow without fear of injury. When crotons are needed for outdoor bedding, the stock from which cuttings have been taken can be utilised for filling in, if there is a likelihood of scarcity of plants for that purpose. Mossing the tops of crotons is a satisfactory method of obtaining well-furnished specimen plants without having to wait for like results from rooted cuttings. There should be no undue haste in severing the tops.

#### HOW TO TREAT HARDY SHRUBS.

In the "Florists' Exchange" the following advice is given on this point by Mr. S. C. Moon:—

I will assume that we all understand by the term "hardy shrubs" the class of perennial, bushy plants, deciduous and evergreen, though largely deciduous, which are used for ornamenting lawns and gardens. Though most are of moderate size when planted, some of them eventually attain the proportions of small trees. The term "hardy" will vary with the location of the



planting, but will not materially affect the suggestions here presented. How to plant them will be considered in a twofold light; first, the distribution and arrangement of the plants on the lawn; second, the method of setting the roots in the ground.

#### PLANTING IN MASSES MOST EFFECTIVE.

As a general rule the most effective way to plant shrubbery is in masses, with not too much variety in one group. Professor Bailey says: "The shrubbery masses should be placed on the boundaries, for it is a fundamental concept of landscape gardening that the centre of a place should be open. In most places, the mass, or border planting, should be the rule, and the isolated specimens the exception; but, unfortunately, the rule is usually reversed." It is easy to see conspicuous evidences of the truth of these statements in almost any suburban neighbourhood in examples of both good and poor arrangements.

Many planters seem to think it desirable to have a well-developed plant of as many varieties as can find accommodation on the lawn in order that they may enjoy each plant individually as it passes through its varying changes of foliage, flowering, fruitage, and leaflessness throughout the year. Such an arrangement may be appropriate for an arboretum or trial ground, and there are special charms in such a collection of shrubs as each successfully comes into bloom. But as the blooming period of most shrubs is only from two to four weeks, the beauty of foliage hues, both in the greenness of summer and autumn colourings, is an important consideration in arrangement of shrubbery groups. The introduction of bright-coloured foliage, such as golden elder or philadelphus, variegated weigelia, purple-leaved plum and barberry, &c., is occasionally done very effectively, but more frequently the result is a conspicuous blotch amid the verdure. The handling of bright colours always requires a high degree of artistic skill, or the result will be displeasing to the most refined tastes, affording valuable object lessons to the student and gardener, but it is not the way to produce the most effective results in lawn adornment.

To quote again from Professor Bailey's essay on shrubbery: "Plants scattered over a lawn destroy all appearance of unity and purpose in the place. Every part of the place is equally accented. The area has no meaning or individuality. The plants are in the way. They spoil the lawn. The place is random."

In large grounds the shrubbery border should be composed of successive masses of several plants of one species together, followed by another harmonious group of another sort, the border of the two groups interlacing with each other. Let the transition from one variety to another be gradual—not too sudden—and the groups not too large or too exclusive. An odd plant, taller or different from the others, may occasionally stand out or above its companions very effectively; of course, tall growers at the back flanked with smaller and low-branching species in the foreground.

It is not advisable to mix evergreen and deciduous shrubs in the same group. A few shrubs seem to be admirably adapted for filling-in plants. *Tamarix* is one of these which may often be used to relieve formality or to add variety in foliage effect, it being a tall, neat, inoffensive plant, which will harmonise with almost any other one. For low-drooping shrubs, to be used for carrying foliage from the grass lawn up to taller plants, few are more effective than *Spiræ Thunbergi*, *Stephanandra*, *Rhodotypus*, and *Berberis Thunbergi*.

#### KNOWLEDGE OF PLANT HABITS ESSENTIAL.

The outlines of shrubberies should not be too straight or formal, but irregular and natural. A skilled florist or gardener should almost conceive these ideas without instructions, but definite knowledge of the habits of the different shrubs to be employed is essential to enable one to make a planting

which will develop consistently as they increase in age and size. That such information can only be obtained successfully by observation and experience is evidenced by the very large number of inharmonious combinations that are seen in shrubberies all about the country. Probably rhododendrons are treated injudiciously, and are a source of disappointment and waste of money more than any other shrub, largely through misunderstanding. Rhododendrons are sociable individuals, liking the companionship and protection of other plants. Their fine, fibrous roots delight in cool moist soil, but do not want to go very deep in earth to find these conditions, and are particularly sensitive to excessive heat or drought in midsummer. A situation where the shadows of large trees or buildings will shield mid-day sun in summer and winter, and from severe winds, is an ideal position. A perpetual mulch of leaves renewed each autumn, and with a light coat of stable manure on top of the leaves to keep them from blowing away, is most congenial to them. Mulching and shelter from wind are the most essential conditions.

Times of Sunrise and Sunset at Brisbane, 1909.

DATE.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4.57	6.46	5.21	6.42	5.40	6.20	5.57	5.46	7 Jan. ☉ Full Moon 0 13 a.m. 15 „ ☾ Last Quarter 4 11 „ 22 „ ☿ New Moon 10 12 „ 29 „ ☾ First Quarter 1 7 „
2	4.57	6.46	5.22	6.41	5.41	6.19	5.58	5.45	
3	4.58	6.46	5.22	6.41	5.42	6.18	5.58	5.44	
4	4.59	6.46	5.23	6.40	5.42	6.17	5.59	5.43	
5	4.59	6.46	5.24	6.40	5.43	6.16	5.59	5.42	
6	5.0	6.47	5.25	6.39	5.44	6.15	6.0	5.41	
7	5.1	6.47	5.25	6.38	5.44	6.14	6.0	5.40	
8	5.2	6.47	5.26	6.38	5.45	6.13	6.1	5.39	5 Feb. ☉ Full Moon 6 25 p.m. 13 „ ☾ Last Quarter 10 47 „ 20 „ ☿ New Moon 8 52 „ 27 „ ☾ First Quarter 0 49 „
9	5.2	6.47	5.27	6.37	5.45	6.12	6.1	5.38	
10	5.3	6.47	5.28	6.36	5.46	6.11	6.2	5.37	
11	5.4	6.47	5.28	6.36	5.46	6.10	6.2	5.35	
12	5.5	6.47	5.29	6.35	5.47	6.9	6.3	5.34	
13	5.5	6.47	5.30	6.34	5.48	6.7	6.3	5.33	
14	5.6	6.47	5.30	6.33	5.48	6.6	6.4	5.32	
15	5.7	6.47	5.31	6.33	5.49	6.5	6.4	5.31	7 Mar. ☉ Full Moon 0 56 p.m. 15 „ ☾ Last Quarter 1 42 „ 22 „ ☿ New Moon 6 11 a.m. 29 „ ☾ First Quarter 2 49 „
16	5.8	6.47	5.32	6.32	5.49	6.4	6.5	5.30	
17	5.9	6.47	5.33	6.31	5.50	6.3	6.6	5.29	
18	5.9	6.47	5.33	6.30	5.50	6.2	6.6	5.29	
19	5.10	6.46	5.34	6.29	5.51	6.1	6.7	5.28	
20	5.11	6.46	5.35	6.28	5.51	6.0	6.7	5.27	
21	5.12	6.46	5.35	6.28	5.52	5.59	6.8	5.26	
22	5.12	6.46	5.36	6.27	5.52	5.57	6.8	5.25	6 Apr. ☾ Full Moon 6 28 a.m. 14 „ ☾ Last Quarter 0 30 „ 20 „ ☿ New Moon 2 51 p.m. 27 „ ☾ First Quarter 6 36 „
23	5.13	6.46	5.37	6.26	5.53	5.56	6.9	5.24	
24	5.14	6.45	5.37	6.25	5.53	5.55	6.9	5.23	
25	5.15	6.45	5.38	6.24	5.54	5.54	6.10	5.22	
26	5.16	6.45	5.38	6.23	5.54	5.53	6.10	5.21	
27	5.17	6.44	5.39	6.22	5.55	5.52	6.11	5.20	
28	5.17	6.44	5.40	6.21	5.55	5.51	6.12	5.19	
29	5.18	6.43	...	...	5.56	5.50	6.12	5.18	
30	5.19	6.43	...	...	5.56	5.48	6.13	5.17	
31	5.20	6.42	...	...	5.57	5.47	...	...	



Statistics.

COMMONWEALTH METEOROLOGY.  
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1908.											1909.	
	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
<i>North.</i>													
Bowen ... ..	5.63	9.46	3.73	0.99	0.45	0.88	0.51	0.96	2.47	0.42	0.42	15.48	4.52
Cairns ... ..	8.03	20.60	5.99	3.05	0.59	3.70	2.12	0.74	3.07	1.60	1.41	32.05	5.25
Geraldton ... ..	13.27	39.00	14.23	18.52	2.64	8.11	3.66	2.81	6.93	3.80	1.69	47.92	10.29
Gindie State Farm ... ..	7.17	6.25	0.02	0.112	...	0.40	1.27	...	...	...	...	...	...
Herberton ... ..	5.02	8.92	1.40	0.38	0.31	2.36	Nil	0.51	1.27	0.61	0.78	12.41	2.28
Hughenden ... ..	5.18	6.91	0.30	Nil	0.05	0.68	Nil	Nil	1.67	1.94	1.05	7.55	1.55
Kamerunga State Nurs. ... ..	7.47	25.75	4.60	3.363	0.76	4.85	1.53	...	3.64	1.69	...	...	3.52
Mackay ... ..	3.83	17.43	14.82	3.25	1.29	1.65	0.71	2.27	1.80	2.57	0.2	15.00	1.36
Rockhampton ... ..	9.64	9.77	2.62	0.85	0.10	1.08	0.84	0.20	2.14	2.47	1.37	9.01	2.01
Townsville ... ..	6.69	9.03	0.38	2.22	Nil	1.70	0.27	0.28	1.58	1.26	0.7	6.94	1.70
<i>South.</i>													
Biggenden State Farm ... ..	9.82	9.84	2.97	0.74	0.43	0.49	2.33	1.39	1.80	2.12	3.66	7.37	2.68
Brisbane ... ..	8.43	18.19	2.45	2.40	0.17	0.77	2.83	0.67	1.77	2.25	1.28	1.99	2.72
Bundaberg ... ..	2.82	7.35	4.13	0.67	0.39	0.75	1.56	1.10	2.39	0.73	3.34	6.52	3.70
Dalby ... ..	4.88	7.61	0.11	0.37	0.63	0.14	1.80	1.13	2.55	3.65	1.56	1.46	3.55
Esk ... ..	10.06	17.04	2.83	1.07	0.23	0.46	2.75	2.16	1.29	5.99	3.62	2.64	3.21
Gatton Agric. College ... ..	3.38	10.74	...	0.10	0.16	0.6	2.71	1.84	1.93	5.71	1.29	1.94	5.00
Gympie ... ..	11.77	8.08	1.87	2.00	0.38	1.16	2.87	1.37	2.49	2.58	3.97	3.86	3.77
Ipswich ... ..	6.63	13.77	2.71	1.14	0.12	0.47	3.23	1.19	1.48	5.09	1.05	1.37	1.95
Maryborough ... ..	8.07	11.40	2.52	1.05	0.46	0.81	1.98	1.05	1.84	1.92	1.64	8.36	7.11
Roma ... ..	6.38	2.51	0.22	Nil	0.55	0.63	1.38	1.12	2.15	2.79	1.68	5.19	4.85
Roma State Farm ... ..	...	...	...	...	...	1.27	0.73	...	...	...	...	...	...
Tewantin ... ..	12.47	14.39	7.59	8.66	0.75	1.97	2.70	2.18	2.30	7.50	4.12	6.44	3.31
Warwick ... ..	4.52	6.65	1.40	0.15	0.80	1.24	2.99	1.96	0.96	5.28	2.02	0.87	0.82
Westbrook State Farm ... ..	8.03	1.41	1.40	00.5	...	0.49	1.97	...	...	2.05	...	...	2.61
Yandina ... ..	14.47	16.62	5.45	4.59	0.58	2.64	2.18	1.50	3.10	6.03	2.75	6.69	6.42

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,  
Divisional Officer.

Science.

ANALYSES OF ENSILAGE.

By J. C. BRÜNNICH, Agricultural Chemist.

The accompanying analyses of ensilage will doubtless prove of great interest to farmers and others. It will be noted that a sample of weed ensilage was forwarded from the State school, Doctor's Creek, Meringandan, which Mr. Brünnich considers to be highly nutritious fodder, provided strong-smelling weeds are not present. It is highly satisfactory to find a school teacher taking an interest in agricultural matters, and we shall be very pleased to hear from more of them on such subjects.

Variety and Locality.	Dry Subs. in Green Material.	Moisture.	Ash.	Fibre.	NUTRIENT MATTER.				Albumenoid Ratio.	Remarks.
					Carbohydrate by Difference.	Fat and Oil.	Protein N x 6.25.	Total Nutrient Matter.		
1. Weed, State School, Doctor's Creek	41.50	7.96	14.83	33.76	28.99	2.91	11.55	43.45	1:6.4	FROM A PIT SILO. Filled March, 1908. Taken September, 1908. Odour is rank and aromatic. Eaten by cattle, but not readily. Some of the weeds which still could be identified were—Spinach ( <i>Amaranthus spec.</i> ), Stinking Roger ( <i>Tagetes glandulifera</i> ), Fat Hen ( <i>Chenopodium carinatum</i> ), and also Vittadinia ( <i>Lepidium onderab</i> ), Salsolikali Filled March, 1907. Taken October, 1908, 3 feet from bottom of silo. Readily eaten by stock. Acidity = 1.00 % lactic acid
2. Sorghum, Biggenden State Farm, rather more than full matured	30.90	6.30	13.96	38.85	31.01	1.56	7.32	39.89	1:10.8	
3. (Immature) Sorghum, Biggenden State Farm	23.40	7.30	13.63	30.20	40.69	1.62	6.56	48.87	1:13.0	2nd growth Early Orange Sorghum. Filled June, 1907. Taken August, 1908. Sample showed well-formed seeds. HCN absent. More readily eaten by stock than older silage. Acidity, 1.30 % lactic acid
4. Sorghum, State Farm, Roma (Planter's Friend)	28.00	8.20	11.28	35.76	39.82	1.74	3.20	44.76	1:27.1	Age of ensilage, 19 months. Stock eat it readily. Milk is flavoured by it (from a 60-ton galvanised-iron lined silo). Acidity, 1.08 % lactic acid

1. The ensilage made from weeds is a highly nutritious fodder, and only the strong flavour of some of the weeds would be a drawback when feeding milking cows.
- 2 and 3. There is not much difference between the over-ripe and barely ripe sorghum ; both were absolutely free from hydrocyanic yielding glucoside. It appears that the time when sorghum is coming well into hand is the best to make ensilage, as already previous investigations have shown clearly that the fodder at that period of growth is quite safe.
4. This is a very poor sample of ensilage, being deficient in nitrogenous matter.



## Tropical Industries.

### COCOANUT CULTURE.

By A. H. BENSON, Instructor in Fruit Culture.

The cocoanut palm is essentially a tropical plant, and requires a good and even rainfall, combined with an equable climate for its proper development. These conditions are obtainable throughout the islands of the Pacific and Indian Oceans lying within the tropics, the south-eastern coast of Asia, the east and west coasts of tropical Africa, the West Indian Islands, and parts of the eastern tropical seaboard of America.

As far as Australia is concerned, the area in which cocoanut culture is commercially possible is confined to the north-eastern seaboard of Queensland and the island of New Guinea.

The district in Queensland in which the climatic conditions are suitable for the growth of cocoanuts extends along the north-eastern coast line from the mouth of the Herbert in the South to Princess Charlotte Bay in the North, a distance of some 400 miles.

Cocoanuts can be grown to the south of the Herbert, at Townsville, Bowen, and Mackay, also to the north of Princess Charlotte Bay; but I am of opinion that their cultivation commercially will be within the limits I have mentioned—viz., from 14 deg. to 18 deg. south. So far, the growing of cocoanuts has not been attempted on a commercial scale in this State, although a considerable number of trees are scattered along the coast at different points. A fair market is obtained for the ripe nuts, but the manufacture of copra and the utilisation of the coir has not been attempted, except in a very small way.

Sufficient experience, however, has been gained to show us that we can grow good nuts, and that we can produce good copra from such nuts; in fact, no better copra was exhibited at the recent Franco-British Exhibition than the samples that were prepared by Mr. J. Robbins, of Port Douglas, for this Department, and our cocoanuts compared favourably with any in the show.

There is a considerable area of coast country within the limits I have given that is suitable for the cultivation of cocoanuts, much of it land that is practically valueless for any other purpose. Sandy loamy soils on the bench lands or coast foothills adjacent to the ocean beach grow the cocoanut to perfection; in fact, it is from soils of this nature that the best of the nuts at Singapore, the Federated Malay States, and Ceylon are obtained.

The cocoanut is one of the most valuable plants of the tropics, as not only is it used in its fresh state for human consumption, but every part of the tree and fruit is made use of. One has only to visit a cocoanut-growing country to appreciate its worth, as besides providing many important food products, both in its green and ripe condition, the leaves are used for mats, baskets, and thatching houses, or for torches; the ash of the leaf is rich in potash, and makes a good lye; the husk of the nut supplies a fibre valuable for brush, mat, matting, mattress, and rope making, and the shell of the nut is made into a good many articles for household use, and is a good fuel. The trunk of the palm is useful for all kinds of buildings, bridge work, &c.; a drink is prepared from the sap that is extracted from the flowers; a spirit is distilled from this sap, and a sugar is obtained from same by boiling. In addition to the value of the nut as a food product when used fresh, it is dried and made into copra, from which an oil valuable for many purposes is extracted. The finest cocoanut oil is converted into a number of food products, such as vegetable butter, and the inferior oil is used for soap-making. The refuse left after the extraction of the oil is used for feeding stock.



Recognising the value of the cocoanut, and knowing that we have a considerable area of land in this State adapted for its cultivation, I took the opportunity of my recent visit to the old country and to the East to obtain all the information that I could respecting the best varieties of nuts to grow, the best methods of growing same, and the best method of utilising the nuts when grown.

In the first place, I was anxious to obtain reliable information as to where the best nuts are grown, as should the industry be started on a commercial scale here, it would be a very great advantage to start with the right kind of nut. In order to obtain this knowledge, I visited Kew Gardens and the Imperial Institute whilst in England, as well as the Botanic Gardens at Singapore, Penang, and Peradynia, in Ceylon. The result of my inquiries and personal observation is to the effect that this is by no means an easy matter to determine, as equally good nuts are to be found in districts that are very distant from each other, and, as far as I could make out, there has been no systematic attempt amongst growers anywhere to produce superior types of nuts. The bulk of the cocoanuts grown in the East are probably derived from the common Java type. As all nuts are reproduced from seed, there are naturally very many different types, not only as regards the size, colour, and shape of the nut, but in the habit of growth of the tree, time the tree takes to come into bearing—prolificness or otherwise. There is also a very great difference in the nuts themselves—some have a heavy coir and a comparatively small nut, whilst others have a large nut and little coir. The size of the nut is not by any means a reliable indication of the quantity of copra it will yield, as some of the largest nuts have quite a thin flesh that dries light, and some of the smaller nuts a thick flesh that yields a good percentage of copra.

Mr. T. W. Main, of the Botanic Gardens, Singapore, when questioned by me respecting varieties of cocoanuts grown in Singapore and the Federated Malay States, replied that although the Malays recognise several types known to them as “Kalapa Gading,” the common hard nut; Kalapa Lugi, a nut that is all edible husk, shell and nut in the young state; Kalapa Puouah; Kalapa Idjo, the immature or green nut of any type; it is probable that they have all been derived from the old original of Java and surrounding islands. Mr. Main also informed me that with the exception of selecting fairly good nuts for planting, there was no attempt made to improve either the yield or quality of the nut. This information was confirmed by Mr. Fox, of the Penang Botanic Gardens, and by Mr. R. H. Lock, of the Royal Botanic Gardens, Peradynia, Ceylon, and was borne out by my personal observations and the inquiries that I made in the plantations owned by Chinese, Malays, and Javanese.

This want of care in the selection of the seed nuts was somewhat of a surprise to me, as I would have expected the planters to have taken particular care in this respect, and to have seen, at any rate, that the seed nuts were obtained from trees yielding heavy and regular crops of nuts giving a high yield of copra.

This want of care in selection is apparently not confined to the Malay Peninsula, Ceylon, and India, as in a “report on cocoanuts in Manila,” by Mr. William S. Lyon, Chief of the Division of Plant Industry of the Bureau of Agriculture, published in 1903, attention is drawn to this particular, and an instance is given of a planter who possessed a remarkably prolific tree, that had produced not less than 200 nuts annually for twenty-three years, and yet had never thought of selecting the nuts from this particular tree for planting.

This failure to improve the yield and quality of the nuts by careful selection of seed is unfortunate in that all we can do, should we obtain seeds of the best types from the Indian Archipelago or elsewhere, is to get the best nuts we can, and when same come into bearing to carefully select the seed for future planting from those trees only that show especial merit.



## SOILS SUITABLE FOR THE CULTIVATION OF COCOANUTS.

There are two essentials to be borne in mind when selecting soils for cocoanut culture—the first is, that the soil be of such a nature that it will permit of the proper development of the root system of the cocoanut; and the second, that there is no stagnant water at the roots. The first essential quality is found in sandy or sandy loamy soils of a free nature, and the second is a matter of drainage. Besides being of a free nature, the soil should have a good depth, so as to provide plenty of room for root development. An abundance of water in the soil is not a drawback, provided that the water is flowing and not stagnant, as is shown by the fact that extremely fine palms are grown right on the seashore, or on the banks of tidal or other creeks, where their roots are frequently covered with salt or fresh water—water that is moving, not stagnant, as the latter will eventually kill the palm.

Naturally, a soil rich in plant food is to be preferred to one that is deficient in this respect, though from what I have seen of the growth of cocoanuts, the right mechanical condition of the soil has even more to do with the success of the plantation than the richness of the soil.

There are thousands of acres of sandy or sandy loamy soils adjacent to the beaches of north-eastern coastal Queensland that are in the right condition mechanically for the growth of cocoanuts, and that compare favourably with the coast soils of Ceylon and the Federated Malay States, on which cocoanuts are so largely grown. As far as my observation went, decidedly the best palms and nuts were grown on the sandy soil adjacent to the seaboard, the palms grown inland being very inferior to those grown on the coast. The cocoanut palm wants no shelter; in fact, it will not thrive unless it is exposed to all the winds that blow, and it is possibly owing to this fact that it does so well on or near the shore, where it gets the full force of the sea breezes.

## PREPARATION OF THE LAND.

In the East this is usually a very simple matter. The timber is first cleared; holes are then sunk at convenient distances; sometimes these holes are manured and the young plants are set out therein. The subsequent cultivation is merely keeping a ring round the tree free from weeds and the breaking of any scrub or heavy weeds that may spring up between the row of palms till such time that they are tall enough to be out of the way of cattle, when buffaloes are depastured between the palms and keep down the grass and weed growth. This system, however, is unsatisfactory, as it does not give the palms a fair chance, and the yield of plantations started and treated in this manner is very much less than it would be were greater care to be taken to prepare the land properly and to take better care of it when so prepared. In Queensland it will pay us to take much greater care in the preparation of the land. All timber, brush, &c., should be removed and the land stumped, at any rate well enough to permit of the use of a stump-jump plough, so that the surface soil can be well worked and bladey grass and other weeds killed. If the soil is of the free nature that is most suitable for cocoanuts, deep cultivation will not be necessary, as all that is needed is to get the surface soil in a good state of tilth and keep down weed growth by means of surface cultivation. Although the initial expense will be greater, the subsequent cost of keeping the land clean will not be great, as the soils that I have described are easy to work and to keep free from weeds. The young palms planted under such conditions are not checked in their development, but will grow rapidly, and, should the surface soil be kept stirred, they will not suffer from any short spell of dry weather, as the soil, if worked, will retain moisture well. Should there be stagnant water below the soil, as will be probable on some parts of the coast, then it will be necessary to provide deep open drains emptying on to the beach or into a creek—tidal or otherwise—to carry it off. If this is done, the land will grow cocoanuts all right, and there will be no fear of injury to the roots.



## PLANTING.

The nut is not, as a rule, planted out where it is to be grown permanently, but is first sprouted in the nursery and then transplanted to its permanent position. The nursery is in partial shade, and the nuts as gathered from the tree are placed in small heaps on the surface of the ground. If it is rainy weather they will sprout all right without much trouble, the time of sprouting varying from one to as much as six months. If the weather is dry the nuts should be watered occasionally to prevent their drying out.

When the nuts show signs of sprouting go over the heaps and take out those nuts in which the root is showing through the husk, and place them singly in the ground, so that the young top may come away straight.

When the young plants have made a growth of 18 in. to 2 ft. in the nursery, they are ready to plant out. They are often left till they are much bigger, but the general opinion is that they are less liable to get a setback if planted out at the size mentioned. Holes are dug at distances of 30 ft. apart each way, and if the previous cultivation of the land has been carried out thoroughly there is no necessity to go in for preparing them elaborately. All that is necessary is to take out the soil 2 to 3 ft. square to a depth of about 2 ft. Place a few spades' full of good surface soil mixed with cow manure, if obtainable, or with good vegetable mould, in the bottom, and place the nut on same with the top upright. Put a little fine top soil round the roots and press same fairly with the hand, so that the nut cannot shift. Don't fill up the hole—as the palm grows it will fill it, and will thus have a good hold of the ground. The best time to set out the young plants is the beginning of the rainy season, which in the part of Queensland that is suitable for their growth would probably be early in January.

Once the young plants are set out all that is necessary is to keep all stock out of the plantation and to cultivate the land when necessary, to keep down weed growth and to retain moisture in the soil.

I have advised planting the palms 30 ft. by 20 ft., as this distance is found to be about the best. Many palms are planted much closer together, but the closest planting does not give the top room to develop, and the plants are apt to become spindly and crop indifferently; further, the greater distance apart gives more room for root development, a matter of considerable importance when the soil is not too rich.

## MANURING.

The cocoanut makes a fairly heavy demand on the soil for nitrogen and potash, and to a certain extent on phosphoric acid. Lime is also an essential, but, as a rule, in the soils that I have mentioned there is generally a sufficiency of shell sand incorporated with the soil that will supply all that is required of this particular food. An abundant supply of nitrogen is essential in the earlier periods of the plant's growth, as it is conducive to a vigorous leaf development, which in turn encourages a strong root growth. Potash, although it enters largely into the composition of the stem and leaves, will not be seriously depleted from the soil till the trees come into bearing, after which the application of potash as a manure will probably be found to have a very distinct influence on the yield of nuts produced by the palms.

With regard to nitrogen, as far as Queensland is concerned, the cheapest way of applying this important plant food is by the growing of leguminous crops such as cowpeas, Mauritius beans, velvet beans or pigeon pea between the rows of palms, and then ploughing them in direct, or, if this is not feasible, to brush them down and allow them to rot on the ground where grown. Ploughing the crop in is, however, to be preferred, as when this is done the surface soil can be kept in the high state of tilth necessary to retain the moisture during the dry season. Where available, cow or other animal manure spread around the trees and worked in has a beneficial effect, but as



this manure is not always obtainable in the districts that are suitable for the growth of cocoanuts in this State, we will have to depend mainly on green manuring and commercial fertilisers. In the East practically no manuring other than that of spreading cattle manure round the trees and forking same in is given, but from what I saw on many of the plantations that I visited I am satisfied that many of the trees would have been benefited by more generous treatment, as not only were the trees yielding a small crop of nuts, but the vigour and growth of the trees showed a want of plant food.

#### SUBSIDIARY CROPS.

As the cocoanut takes some eight years to come into bearing, the question naturally arises, is it not possible to get some return from the ground, from crops grown between the rows of trees? This can be done, provided that care is taken to grow the right kinds of crops, and that these crops are manured in such a manner that they will not deplete the soil of its available plant foods, and thus rob the palms of the nutriment required for their proper development. Crops such as pineapples, peanuts, cotton, or sweet potatoes can be grown; also possible, cassava, although the latter is a very exhaustive crop, and will require heavy manuring to replenish the nitrogenous matter it has taken from the soil. Where subsidiary crops are grown it will be necessary not only to manure with farmyard manure or commercial fertilisers, but the growing of green crops and ploughing in of same will be necessary between the successive plantings of the supplementary crops.

#### GATHERING THE CROP.

The nuts should be gathered when ripe, care being taken not to remove immature fruit. The old practice of allowing the nuts to fall on the ground is unsatisfactory, as the nuts are apt to deteriorate thereby. Nuts required for seed purposes should not be thrown on the ground, as this may crack the shells and prevent germination. If possible, the trees should be climbed, without injuring the trees, as done in the South Seas. If, however, men can not be found to climb the trees in this manner, then notches for the insertion of the foot should be cut in the trunk, provided that the trunk is sufficiently mature not to be injured thereby, and that the cuts are made sloping downwards, so as not to retain the rain. This is the method adopted by the Chinese growers, and is not found to injure the trees to any extent, although it has the drawback that it enables borers to obtain entry into the trunk.

#### MANUFACTURE OF COPRA.

The nuts, when gathered, are carried to a shed, where they are first husked. The implement used for husking the nuts is a stout stake driven into the ground and fitted with a strong steel spear top having two cutting edges. The nut is driven on this by hand, and the husk forced off. The husked nut is then cut or broken in half in order to allow the milk to escape and permit of the removal of the copra. The nuts when cut open are usually allowed to remain in the sun for a few hours to partly dry, as this is found to facilitate the removal of the copra. A short stout knife with a curved blade is used to remove the copra. The copra is then dried, either by placing same on the ground in the sun or by drying it over specially constructed kilns. The former takes some three days in favourable weather, whereas kiln drying only takes about twenty-four hours. The kilns used for this purpose are of a very simple nature, and consist of a long furnace, about 3 ft. wide, with brick sides about 2 ft. 6 in. high, covered with sheet iron on which clean white sand is placed. The copra is placed on the sand till dry. The heat used for the drying is obtained by burning the shells. This is a very crude method, and I am satisfied that up-to-date fruit evaporators would do the work more satisfactorily, and produce a much superior article.



## UTILISATION OF THE COIR.

In India, Ceylon, and the Straits Settlements only the very crudest methods are employed in dealing with the coir. The husks are soaked in water for twelve hours or longer, and are then first pounded with heavy hammers. They are then pounded with wooden mallets, and then dried in the sun. When dry they are placed in a heap and beaten with rattan canes to tease out the fibre. This process is a very slow and costly one, and is only possible in countries where there is the very cheapest of labour. In Java machinery for crushing the husks and extracting the fibre is now in use, and besides producing a superior article, it is worked much more expeditiously and cheaply. Machinery suitable for this purpose is manufactured by Thos. Larmuth and Co., Limited, Todleben Ironworks, Cross Lane, Salford, Manchester.

The fibre, after passing through the crushing operations, passes through a winnowing machine, to remove the dust and non-fibrous material, and is then ready for spinning.

In order to make the industry a success in this State I am of the opinion that it will be necessary for the individual planter, or a combination of planters, to erect up-to-date machinery for the preparation and drying of the copra, and also, possibly, for extracting the oil from same, as well as the best machinery for working up the coir. There is a good market for both the oil and the refuse oil cake, as well as for the prepared fibre, in Australia; and, as far as one can judge, there is no reason why cocoanut culture should not be a success here. There is one other question to be considered, and that is the smallest area of cocoanuts in bearing that will be required to keep such machinery going, and the opinion of Mr. L. J. Brown, Inspector of Cocoanut Plantations, F.M.S., is to the effect that 2,000 acres will support an oil and coir factory, and Mr. Wm. S. Lyon, of Manila, whose opinion I have quoted recently, is of the opinion that the minimum size of a plantation on which economical application of oil and fibre preparing machinery could be used is 60 hectares (150 acres).

---

NEW FIBRE PLANT (PITA DEL OPON).

A correspondent of the "Revista del Ministerio de Obras Publicas," Republic of Colombia, describes what is apparently a new and very valuable fibre plant, recently discovered in the forests of the Carare River, a tributary of the Magdalena, in the Santander district and of those of the Opon, where the plant is said to cover many square leagues of country, and is said to be truly a marvel amongst textile plants. The leaf of the plant contains a fine, delicate, tenacious, resistant fibre of extraordinary length, of whitish-lead colour, silky and brilliant, of great flexibility, softer and smoother than the finest cotton. It is a species of Pita, but the fibre is much finer than that of the plant known in Mexico by that name. The leaves are no less than 3 metres (nearly 10 ft.) long. It would not, says the writer, be astonishing if it were found to abound in the extensive forests of other hot districts of Columbia.

---

FERTILISING SMALL GARDENS.

Not everyone wants to apply fertilisers by the acre. There are gardeners who grow small quantities of vegetables and other crops, and who, having no available farmyard manure, have to use artificial fertilisers. The following will, therefore, be doubtless helpful to them:—

One thousand pounds of fertiliser per acre means that 1 lb. will serve for 44 square feet (or for a bed measuring 11 ft. by 4 ft.). One ounce is sufficient for 2.7 sq. ft. If 1 oz. is distributed over 5 sq. ft., it is equivalent to 1 lb. to 87 sq. ft., or 500 lb. per acre.



## General Notes.

### WINDMILLS.

The cheapest windmill is never the most economical one to buy. What is required in such a machine is, that all the iron-work shall be heavy and substantial, the wheel well braced, the fans securely fastened to the arms, and the vane supported by a brace. It must be capable of standing through the heaviest storm. A really good windmill should, with a reasonable amount of care, do good service for from twenty to twenty-five years with a very small amount of expense for repairs. It should be strong enough to do the heaviest work in a light wind; but do not expect a 10-ft. wheel to do the work of a 14-ft. wheel. In erecting a windmill, one thing of importance is to elevate the tower sufficiently high to place the lower curve of the wheel at least 10 ft. above all obstructions, such as trees, buildings, hills, &c., so that there may be a free current of air in all directions. Mistakes are often made in placing mills too low, so that the wheel is below the ridge of barns, or tops of trees near by. This not only prevents the mill from receiving the full force of the wind, but subjects it to varying currents that tend to toss the mill about from one point to another and prevent it from doing its work properly; and in strong winds the effect is sometimes damaging. It is better economy to erect a mill too high than too low, as, frequently, the upper current of air is moving sufficiently to run a mill while it would not run in the lower current. Again, the upper current is more steady at all times, and will run a mill at more uniform speed, with less strain.

The most important point of a windmill tower is the anchorage. Perhaps, the best way is to dig holes 4 ft. deep, and fill them with stone laid in water-lime or cement; in this is embedded, to serve as an anchorage, a 2-in. bar of iron, with one end flattened, and holes punched in it for the tower bolts. If it is not convenient, posts may be used with pieces spiked across the bottom for anchors; this is the method generally employed.

Twenty-seven thousand one hundred and fifty-four gallons of water will cover an acre 1 in. in depth, and 1-h.p., with good machinery, will raise this amount of water 1 ft. high in ten minutes; or 10-h.p. will raise it in one minute. One horse-power would put 1 in. of water on 1 acre, elevated 25 ft. above the source, in four and one-sixth hours. Ten horse-power would do the same for 10 acres. Now, from this we get the rule that for 1 in. of water on 1 acre of land we must figure 1-h.p. for ten minutes for each foot in height the water must be raised. It may be more explicit to add that 1-h.p. is defined as the combined pulling strength of four ordinary horses. In theory, a horse-power is equal to 33,000 lb. lifted 1 ft. high in one minute of time.—“Irrigation Farming,” by Lucius M. Wilcox.

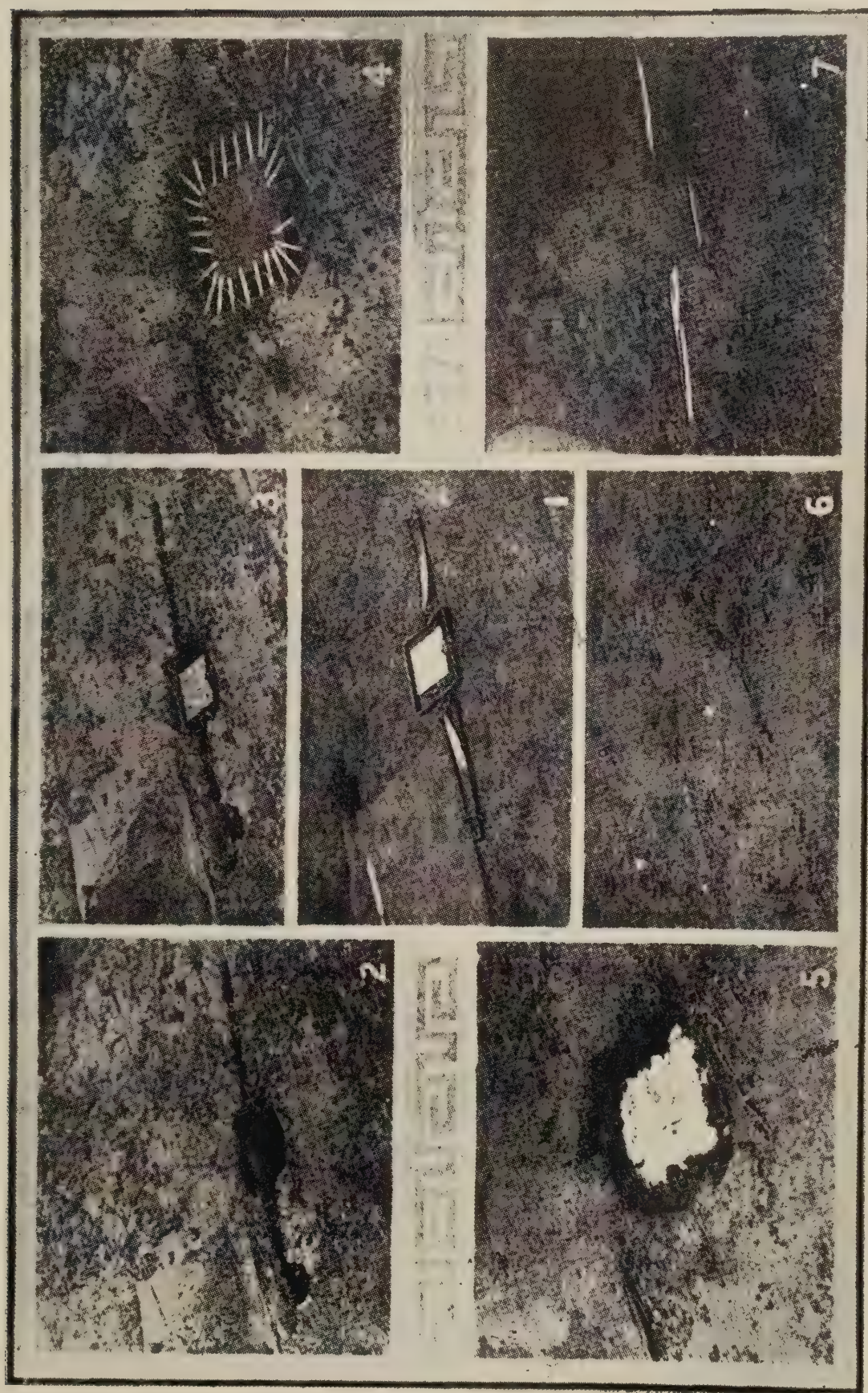
### DINGO TRAPPING.

The following instructions how to trap native dogs, which we reprint from an extract from the “Journal of Agriculture” of Western Australia, are taken from Mr. Ross’s method, and, with the illustrations and instructions carefully followed, any person should be able to trap any ordinary dingo.

Of course, when a dog becomes very cunning, it requires much more skill to catch him, and this is only obtained by experience.



Plate XXVII.



SETTING A DINGO TRAP.





To catch a dingo it is first of all necessary to allay all his suspicions of danger, either by sight or smell, about the ground where the trap is to be set, indicating that this has been tampered with in any way. The simple way of setting a trap without its being hidden, with a bait on it, will only catch very inexperienced dogs. The trap must be buried in such a way that it will easily snap, and the soil must be replaced in such a way that it does not differ from the surrounding country. A cutting is made in the ground exactly the size of the trap, and is then carefully covered over, as will be more fully described later on.

The first thing to do is to find the beat of the dingo. To anyone familiar with the country this should not be a difficult matter, as nearly all dogs have tracks on which they go regularly. It may be perhaps only once or twice a week, or possibly once in two weeks, as some dogs travel about much more than others. Nearly all dogs have regular scratching places, and if the beat cannot be found the scratching place is the next best place to set the trap. When you have found the dog's beat or his scratching place, be very careful not to approach it too closely, otherwise he may see your tracks or smell your scent. On no account ever walk in front of the place where the trap has to be set. When you have decided on the exact spot in which to place the trap, which, if you have found the dog's regular beat, should be on it, take a bag and put it carefully down almost on a level with the dog's track, and upon this bag stand or kneel, and on it also put the soil which is taken from the hole in which you bury the trap, then take the trap and set it down at right angles to the end of your bag, having the plate exactly in the dog's track, and always keeping the heel of the trap next to the bag, then with a knife carefully mark the outline of the trap; put the trap to one side now, and with your knife cut all round the marks you have made. Cut out the ground now on the inside of your marks as neatly as possible, taking out the centre of where the trap is to be first, and put all your loose soil upon the bag upon which you are kneeling. When doing this be careful not to rest your hand upon the ground anywhere near the dog's track, but after you have taken the soil out from the centre you can rest it there while you are taking out parts for the springs. When you have the hole sufficiently large and deep, set the trap, and put it carefully in the ground so that the plate will be  $\frac{1}{4}$  in. below the surface, then fill in over the springs very lightly. Use a little horse manure or light leaves to go round the side of the plate so as to prevent the soil from getting underneath them, as this must always be kept so as to allow the plate to drop when the dog's foot goes on it. Next put the soil carefully all around the jaws of the trap, and be very careful to see that there are no small stones or bits of wood in the soil that might possibly get in the jaws near the spring, and thus keep it from closing tightly. Get a light twig that will reach across the edge of the jaws diagonally, and place it carefully underneath the plate, resting it on the opposite corners of the jaws, so as to take the weight of the soil off the plate. The twig must be very light and easily broken, so that when the dog puts its foot on the plate the twig will snap and let the plate go down; then take some small twigs about the size of safety matches and place them from the edge of the plate to the edge of the jaws, as shown in illustration. When this is done get a piece of paper the size of the centre of the trap, making one or two tears about the centre of the paper so as to allow the air to escape. In the summer time the paper may be wet so as to make it easy to break, then take some sand or earth and work it around the inside of the trap, taking care to spill none outside. Then take a small stick and work it gently in the centre of the trap so as to bring the soil on the plate on a level with the surrounding soil. Be careful to put the same kind of soil or sand on the top as is on the surrounding surface. By blowing over the surface or by using your hat as a fan, the place where the trap is concealed may be quite easily hidden, so that it cannot be distinguished. Next take two or three twigs or sticks about  $\frac{1}{4}$  in. thick and lay



them along where the springs are concealed, to within about  $\frac{1}{4}$  in. off the jaws of the trap, then get a little rubbish, such as decayed vegetable matter, and place it on the end of these sticks level with the jaws, then get another twig about the size of a small penholder and place it just on the side of the trap over the catch of the tongue, so as to keep the dog from putting his foot on the tongue, to make sure that he will put his foot on the plate of the trap, as a dog will never put his foot on a little bit of stick like this if there is a smooth place for him alongside. It is advisable to put two small sticks, one at each end of this last one that has been put down, in case it should be shifted by lizards or small animals running over it. This stick that is put down about the size of a penholder should be a little longer than the plate itself. The jaws of the trap should never be very sharp, the teeth should be either blunted or wrapped on the ends with wire so as to prevent it cutting the dog's leg off, and thus allowing him to escape. The kind of trap that Mr Ross recommends is the 7-in. double-springed horseshoe trap with the falling plate, and he specially recommends anyone to avoid using the balance plate. (Horseshoe traps can be purchased at about 7s. each.) If a dog should happen to get caught and get away, the next time he comes along he will look out for the small sticks that have been set about the surface of the ground over the trap. To catch such a dog the best way is not to use sticks. All the dirt that has been taken from the hole and has been put on the bag and not replaced should be gathered up in the bag and taken some little distance and thrown away, but on no account leave any lying about where the trap has been set. Put nothing whatever in the way of bait on the traps, as this only attracts native cats, ants, and other small game, and may cause the trap to be snapped without catching the dog. If a dog runs a road where it is not safe to set a trap, the trap may be set on one side in the same method as before-mentioned, and the dog's attention attracted to the place by some of the dung and urine of other dogs. A little distance in advance of where the trap is set a sapling should be laid down in a slanting direction, with the nearest end towards where the trap is; the fact of the sapling being laid down will attract the dog's attention, and instead of jumping over it he will probably go round the end, and by so doing would probably smell the dung and urine laid as a lure for him. The dung should be just on the heel of the trap or back of the tongue. It should be exactly in this position, as when the dog goes to smell it he will then place his fore-feet exactly over the plate. In all cases be careful to remember that the heel or back of the trap must be kept next to the bag upon which you stand or kneel. When setting a trap on the side of a road like this, be careful on no account to walk in front of it, but keep at the back, and use the same precautions that were given in the first instance. It is better not to chain or wire the trap in any way, as even if the dog does make off with the trap it would be very easily tracked. The illustration will show the different methods from the marking out of the trap until the operation is complete. They are numbered from 1 to 7, and may be briefly referred to as follows:—Fig. 1, trap laid down ready to mark out ground; fig. 2 shows the hole made to place the trap in; fig. 3, trap in position; fig. 4, pieces of thin sticks or twigs to support paper; fig. 5, paper placed over plate in order to prevent dirt from getting underneath; fig. 6, trap covered and dirt dusted over it; fig. 7, sticks laid down on finished trap.

#### CURE FOR BLIGHT IN CATTLE.

Mr. H. Knight, of Bell, writes to say that, after trying several remedies as a cure for blight in cattle, he blew sugar of lead into their eyes when they were almost blind. Two applications were sufficient to effect a cure, the second dose being administered two days after the first.

## FROZEN PIGS FROM CHINA.

It would hardly be expected that food-stuffs would be exported from a country whose inhabitants number from 400,000,000 to 600,000,000, and where famine widely extended is of frequent occurrence. Yet Sir Thomas Sutherland, speaking at a late meeting of the Peninsular and Oriental Steam Navigation Company, stated that the Chinese trade was one of the company's most promising fields of operation, and that they expected to benefit very largely in the near future by the export of frozen Chinese pigs. So far as he was aware, a Chinese pig had never been sent to England yet. It would be interesting to learn under what conditions these frozen pigs are reared. We doubt if a consignment of Chinese pork would sell readily in the Commonwealth.

---

## Answers to Correspondents.

## TOMATO BEETLES.

E. ROUND, Wellington Point—

The specimen of tomato plants you forwarded has been handed to the Entomological Department, to be submitted to the Government Entomologist on his return to Brisbane. It would be well to also forward a specimen of the brown beetle you mention.

WOODASH FERTILISATION—CLINICAL THERMOMETER—  
SORGHUM POISONING.

P.A.P., Ipswich—

In reply to your questions:—

(a.) The ashes of trees contain comparatively large amounts of mineral plant-food, lime, potash, and phosphoric acid, and the fertilising action of the ash must have produced the heavier crop.

(b.) Hick's  $\frac{1}{2}$ -minute clinical thermometer. A little oil should be smeared on the mercury end of it, and the instrument passed into the rectum, where it should remain for about one minute.

(c.) Sorghum poison remains a very short time in the system. The majority of animals affected die, but those that recover may have their systems so reduced as to render them, in rare instances, liable to suffer a relapse if they have been previously affected with redwater. Also, if cattle were so affected about the same time as the feeding on young sorghum took place, the severity of the redwater infection would be increased.

---



## The Markets.

### PRICES OF FRUIT—TURBOT-STREET MARKETS.

Article.						MARCH.
						Prices.
Apples (Hobart), per case ...	...	...	...	...	...	6s. to 7s.
Apples (Victorian), per case ...	...	...	...	...	...	6s. to 8s.
Apples (Local), per case ...	...	...	...	...	...	4s. to 6s.
Apples (Cooking), per case ...	...	...	...	...	...	4s. 6d. to 6s.
Bananas (Cavendish), per dozen ...	...	...	...	...	...	1½d. to 2½d.
Bananas (sugar), per dozen ...	...	...	...	...	...	1½d. to 2d.
Grapes (Choice), per lb. ...	...	...	...	...	...	1½d. to 3d.
Lemons (Italian), per case ...	...	...	...	...	...	9s. to 10s.
Lemons (Sydney), per case ...	...	...	...	...	...	...
Mangoes, per case ...	...	...	...	...	...	...
Nectarines, per case ...	...	...	...	...	...	...
Passion Fruit, per quarter-case ...	...	...	...	...	...	2s. to 2s. 6d.
Papaw Apples, per quarter-case ...	...	...	...	...	...	...
Peaches, per quarter-case ...	...	...	...	...	...	2s. 6d. to 4s.
Pears, per half-case ...	...	...	...	...	...	6s. to 8s.
Persimmons, per quarter-case ...	...	...	...	...	...	2s. 6d. to 3s.
Pineapples, best rough, per dozen ...	...	...	...	...	...	1s. to 1s. 6d.
Pineapples (Choice), smooth, per dozen ...	...	...	...	...	...	2s. 6d. to 4s. 6d.
Plums, per quarter-case ...	...	...	...	...	...	5s.
Tomatoes, per quarter-case ...	...	...	...	...	...	1s. 6d. to 2s.

### SOUTHERN FRUIT MARKET.

Apples (Local), eating, per case ...	...	...	...	...	...	7s. to 9s.
Apples (Local) cooking, per case ...	...	...	...	...	...	3s. 6d. to 5s. 6d.
Apricots (Tasmanian), per quarter-case ...	...	...	...	...	...	...
Apricots (Choice), per quarter-case ...	...	...	...	...	...	...
Bananas (Queensland), per bunch ...	...	...	...	...	...	1s. 6d. to 3s.
Bananas (Queensland), per case ...	...	...	...	...	...	7s. to 7s. 6d.
Grapes (Queensland), Muscatels, per box ...	...	...	...	...	...	6s. to 7s.
Lemons (Local), per gin case ...	...	...	...	...	...	8s. to 12s.
Lemons (Italian), per half-case ...	...	...	...	...	...	9s. to 10s.
Lemons (Italian), per double case ...	...	...	...	...	...	21s. to 23s.
Mandarins (Emperor), per case ...	...	...	...	...	...	...
Mandarins (medium), per case ...	...	...	...	...	...	...
Mangoes, per case ...	...	...	...	...	...	2s. to 3s.
Nectarines, per half-case ...	...	...	...	...	...	2s. 6d. to 4s. 6d.
Oranges (Choice), per case ...	...	...	...	...	...	4s. to 5s.
Passion Fruit (Choice), per half-case ...	...	...	...	...	...	3s. to 3s. 6d.
Peaches (Slipstones), per half-case ...	...	...	...	...	...	2s. 6d. to 4s.
Pears (Choice), per case ...	...	...	...	...	...	10s. to 12s.
Persimmons, per box ...	...	...	...	...	...	3s. to 3s. 6d.
Pineapples (Queensland), choice, Queens, per case ...	...	...	...	...	...	3s. to 5s.
Pineapples (Queensland), Ripley Queen, per case ...	...	...	...	...	...	4s. 6d. to 5s. 6d.
Pineapples (Queensland), choice common, per case ...	...	...	...	...	...	3s. 6d. to 4s. 6d.
Plums, per half-case ...	...	...	...	...	...	1s. 6d. to 2s. 6d.
Quinces, per gin case ...	...	...	...	...	...	3s. to 4s.
Rock melons (Local), per case ...	...	...	...	...	...	1s. 6d. to 3s.
Rock melons (Queensland), per gin case ...	...	...	...	...	...	1s. 6d. to 2s.
Tomatoes (Local), per half-case ...	...	...	...	...	...	2s. 6d. to 3s.
Water melons (Queensland), choice, per dozen ...	...	...	...	...	...	3s. 6d. to 6s.
Water melons, medium, per dozen ...	...	...	...	...	...	3s. 6d. to 6s.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR  
FEBRUARY.

Article.								FEBRUARY.
								Prices.
Bacon, Pineapple...	...	...	...	...	...	lb.		10d. to 11½d.
Barley, Malting...	...	...	...	...	...	„		3s. 6d. to 3s. 9d.
Bran...	...	...	...	...	...	ton		£4 15s.
Butter, Factory...	...	...	...	...	...	lb.		9½d.
Chaff, Mixed...	...	...	...	...	...	ton		£5.
Chaff, Oaten...	...	...	...	...	...	„		£4 15s. to £5 5s.
Chaff, Lucerne...	...	...	...	...	...	„		£5 to £6
Chaff, Wheaten...	...	...	...	...	...	„		£2 15s. to £3 5s.
Cheese...	...	...	...	...	...	lb.		6½d. to 7d.
Flour...	...	...	...	...	...	ton		£10 10s.
Hay, Oaten...	...	...	...	...	...	„		£6 to £6 10s.
Hay, Lucerne...	...	...	...	...	...	„		£4 to £4 10s.
Honey...	...	...	...	...	...	lb.		2d. to 2¼d.
Maize...	...	...	...	...	...	bush.		4s.
Oats...	...	...	...	...	...	„		...
Pollard...	...	...	...	...	...	ton		£5 10s. to £6 10s.
Potatoes...	...	...	...	...	...	„		£6 to £6 10s.
Potatoes, Sweet...	...	...	...	...	...	„		...
Pumpkins...	...	...	...	...	...	„		...
Wheat, Milling...	...	...	...	...	...	bush.		4s. to 4s. 3d.
Wheat, Chick...	...	...	...	...	...	„		4s. 2d.
Onions...	...	...	...	...	...	ton		£8 15s. to £9.
Hams...	...	...	...	...	...	lb.		1s. to 1s. 1½d.
Eggs...	...	...	...	...	...	doz.		10¼d. to 1s. 3d.
Fowls...	...	...	...	...	...	pair		2s. 8d. to 4s.
Geese...	...	...	...	...	...	„		7s. to 7s. 3d.
Ducks, English...	...	...	...	...	...	„		2s. 6d. to 3s. 3d.
Ducks, Muscovy...	...	...	...	...	...	„		3s. 7d. to 4s. 10d.
Turkeys (Hens)...	...	...	...	...	...	„		7s. to 8s.
Turkeys (Gobblers)	...	...	...	...	...	„		10s. to 15s.

ENOGGERA SALEYARDS.

Animal.								FEBRUARY.
								Prices.
Bullocks...	...	...	...	...	...	...	...	£8 7s. 6d. to
„ (single)...	...	...	...	...	...	...	...	£9 2s. 6d.
Cows...	...	...	...	...	...	...	...	£10 2s. 6d.
Merino Wethers...	...	...	...	...	...	...	...	£7 5s. to £8 10s.
Crossbred Wethers...	...	...	...	...	...	...	...	16s. 9d.
Merino Ewes...	...	...	...	...	...	...	...	17s. 3d.
Crossbred Ewes...	...	...	...	...	...	...	...	11s. 3d.
Lambs...	...	...	...	...	...	...	...	18s.
Pigs (porkers)...	...	...	...	...	...	...	...	13s. 6d.
„ (slips)...	...	...	...	...	...	...	...	46s.
								15s. 6d.



## Orchard Notes for May.

By ALBERT H. BENSON, M.R.A.C.

### THE SOUTHERN COAST DISTRICTS.

The advice that I have given respecting the handling and marketing of citrus fruits in the last two numbers of this Journal apply with equal force to this and the following months. Do not think that you can give the fruit too much care and attention; it is not possible, as the better they are handled, graded, and packed the better they will carry, and the better the price they will realise.

Continue to pay careful attention to specking, and fight the blue mould fungus everywhere. Don't let mouldy fruit lie about on the ground, hang on the trees, or be left in the packing shed, but destroy it by burning. Keep a careful look-out for fruit-fly, and sweat the fruit carefully before packing. If this is done, there will be little fear of the fruit going bad in transit, or being condemned on its arrival at Southern markets. Where the orchard has not been already cleaned up, do so now, and get it in good order for winter. Surface working is all that is required, just sufficient to keep moisture in the soil, keep down undergrowth, and prevent the packing of the surface soil by trampling it down when gathering the fruit.

Keeping the orchard clean in this manner enables any fallen fruit to be easily seen and gathered, and I need hardly state what I have mentioned many times before, that diseased fruit should on no account be allowed to lie about and rot on the ground, as this is one of the most frequent causes of the spreading of many fruit pests.

May is a good month to plant citrus trees, as if the ground is in good order they get established before the winter, and are ready to make a vigorous growth in spring.

Don't plant the trees, however, till the land is ready, as nothing is gained thereby, but very frequently the trees are seriously injured, as they only make a poor start, become stunted in their growth, and are soon overtaken by trees planted later, that are set out under more favourable conditions. The land must be thoroughly sweet, and in a good state of tilth—that is to say, deeply worked, and worked down fine. If this has been done it will probably be moist enough for planting, but should there have been a dry spell, then when the hole has been dug and the tree set therein, and the roots just covered with fine top soil, four to eight gallons of water should be given to each tree, allowed to soak in, and then covered with dry soil to fill up the hole. In sound, free sandy loams, that are naturally scrub, holes may be dug and the trees planted before the whole of the ground is brought into a state of perfect tilth. It is, however, better to do the work prior to planting, as it can then be done in the most thorough manner; but if this is not found possible, then the sooner it is done after planting the better. If the land has been thoroughly prepared, there is no necessity to dig big holes, and in no case should the holes be dug deeper than the surrounding ground either is or is to be worked. The hole need only be big enough to allow the roots to be well spread out, and deep enough to set the tree at the same depth at which it stood when in the nursery. Plant worked trees 24 to 25 ft. apart each way, and seedlings at least 30 ft. apart each way.

Towards the end of the month cover pineapples when there is any danger of frost; dry blady grass or bush hay is the best covering. Keep the pines clean and well worked; first, to retain moisture; and, secondly, to prevent injury from frost; as a patch of weedy pines will get badly frosted when a clean patch alongside will escape without any serious injury.

Slowly-acting manures, such as meatworks' manures, when coarse, boiling-down refuse, farm manures, or composts may be applied during the month, as they will become slowly available for the trees' use when the spring growth takes place, but quickly-acting manures should not be applied now.

#### THE TROPICAL COAST DISTRICTS.

May is a somewhat slack month for fruit—pines, papaws, and granadilas are not in full fruit, the autumn crop of citrus fruit is over, and the spring crop only half-grown. Watch the young citrus fruit for Maori, and when it makes its appearance spray with the sulphide of soda wash. Keep the orchard clean, as from now till the early summer there will not be much rain, and if the orchard is allowed to run wild—viz., unworked and dirty—it is very apt to dry out, and both the trees and fruit will suffer in consequence.

Bananas should be kept well worked, for this reason, and though the fly should be slackening off, every care must still be taken to prevent any infested fruit being sent to the Southern markets.

Citrus fruits can be planted during the month, the remarks *re* this under the heading of the Southern Coast Districts being equally applicable here.

#### THE SOUTHERN AND CENTRAL TABLELANDS.

Get land ready for the planting of new deciduous orchards, as although there is no necessity to plant so early, it is always well to have the land in order, so as to be ready to plant at any time that the weather is suitable. The pruning of deciduous trees can commence towards the end of the month in the Stanthorpe district, and be continued during June and July. It is too early for pruning elsewhere, and too early for grapes, as a general rule. Keep the orchard clean, particularly in the drier parts. In the Stanthorpe district I recommend the growing of a crop of blue or grey field peas, or a crop of vetches between the trees in the older orchards, as a green manure. The crop to be grown as a green manure should have the soil well prepared before planting, and should be manured with not less than 4 cwt. of phosphatic manure, such as Thomas's phosphate, or fine bone-dust, per acre. The crop to be ploughed in when in the flowering stage. The granitic soils are naturally deficient in organic matter and nitrogen, as well as phosphoric acid, and this ploughing in of a green crop that has been manured with a phosphate manure will have a marked effect on the soil.

Lemons will be ready for gathering in the Roma, Barcaldine, and other districts. They should be cut from the trees, sweated, and cured down, when they will keep for months, and be equal in quality to the imported Italian or Californian fruit. If allowed to remain on the trees, the fruit becomes over-large and coarse, and is only of value for peel. Only the finest fruit should be cured: the larger fruit, where the skin is thicker, is even better for peel, especially if the skin is bright and free from blemish; scaly fruit, scabby, warty, or otherwise unsightly fruit is not suitable for peel, and trees producing such require cleaning or working over with a better variety, possibly both.

The remarks *re* other citrus fruit and the work of the orchard generally that I made when dealing with the coast districts, apply equally well here, especially as regards handling the crop and keeping down pests.

---



## Farm and Garden Notes for May.

FIELD.—During this month the principal work in the field will be the sowing of wheat, barley, oats, rye, and vetches. There is no time to lose now in this work. Potatoes should be hilled-up. Cut tobacco. The last of the cotton crop should now be picked, the bushes being stripped daily after the dew has evaporated. Growers are notified that cotton-ginning machinery has been installed by Messrs. Kitchen and Sons in the Valley, Brisbane, so that a sure means of disposing of the crop is available (see Journal of 1st March, 1906). Every effort should be made to ensure feed for stock during the winter by utilising all kinds of green fodder, in the form of silage or hay. Those who own dairy stock will be wise to lay down permanent grasses suitable to the climate and to their particular district and soil. A few acres of artificial grass will support a surprisingly large number of cattle or sheep in proportion to acreage. Couch grass in the West, as has been proved at Barcaldine, will carry ten or twelve sheep to the acre. Coffee-picking should now be in full swing, and the berries pulped as they are picked. Strawberries may be transplanted. The best varieties are Pink's Prolific, Aurie, Marguerite, Hautbois, and Trollope's Victoria. The Aurie is the earliest, and the Marguerite next. In some localities, strawberry planting is finished in March, and the plants bear their first fruits in August. In others, fruit may be gathered in July, and the picking does not end until January.

KITCHEN GARDEN.—Onions which have been planted in seed beds may now be transplanted. The ground should have been thoroughly cleaned, pulverised, and rolled previous to transplanting. Onions may still be sown in the open on clean ground. In favourable weather plant out cabbages, cauliflowers, lettuce, leeks, beetroot, endive, &c. Sowings may also be made of all these, as well as of peas, broad beans, kohl-rabi, radishes, spinach, turnips, parsnips, and carrots. Dig and prepare beds for asparagus. Full instructions for the successful cultivation of this valuable vegetable will be found in the February issue of the Journal, 1906.

FLOWER GARDEN.—Transplanting and planting may be carried out simultaneously during this month in showery weather; the plants will thus be fully established before the early frosts set in. Camellias and gardenias may be safely transplanted, also such soft-wooded plants as verbenas, petunias, penstemons, &c. Cut back and prune all trees and shrubs ready for digging. Dahlia roots should be taken up and placed in a shady situation out of doors. Plant bulbs, such as anemones, ranunculus, snowflakes, freesias, ixias, iris, narcissus, &c. Tulips and hyacinths may be tried, but success in this climate is very doubtful. All shades and screens may now be removed to enable the plants to get the full benefit of the air. Fork in the mulching, and keep the walks free from weeds. Clip hedges and edgings.

---





PLANTING SEASONS, &c., IN DIFFERENT PARTS OF THE STATE OF QUEENSLAND.						
Plant.	SOUTHERN COASTAL DISTRICTS.			DARLING DOWNS.		CENTRAL DISTRICTS.
	How to Sow.	When to Sow.	Amount of Seed or Plants Required.	When to Sow.	How to Sow.	When to Sow.
FIELD CROPS.						
All grasses	D	May to September	½ to 2 bushels per acre	{ European, March to July; Sub-tropical, Sept. to Feb.	D	September to April
Arrowroot	A	August and September	1,700 to 1,800 plants	August to October	A	August to October
Broom millet	D	September to January	6 to 8 lb.	September to February	D	August to January
Buckwheat	D	July	1 to 2 bushels	February and August	D	July to February
Cabbage	B	January to September	2 to 3 lb.	January to September	B	February to August
Cape barley	D	March to June	½ to 1½ bushels (D)	February to June	D	March to May
Carrot	D	July (for field)	3 to 5 lb.	February to August	D	March to June
Chicory	I	July	3 to 5 lb.	February to August	I	March to June
Clover	D	March and August	12 to 20 lb.	March to July	D	March to May
Coffee	O	August to November	1,200 plants	Nil	D	July to November
Cotton	C	August and September	1,200 plants or 5 lb. seed	September	T	July to October
Cowpea	P	January and September	8 lb.	September to January	A	September to February
Field peas	S	April to August	2 bushels	February and July	P	March to July
Ginger	W	August to October	1,201 plants	Nil	S	July to October
Hemp (sisal)	T	September to March	680 plants	September to February	C	August to March
Imphee	D	August to January	10 lb.	September to January	T	August to February
Kafir corn	D	August to January	10 lb.	August to December	D	August to February
Lucerne	D	March to July	10 to 20 lb. (b.c.)	February to July	D	February to August
Maize	A	August to December	½ to 3 bushels (b.c.)	September to January	D	August to March
Mangelwurzel	E	March and April	5 to 6 lb.	Sept. to Nov., & Feb. to April	A	March to May
Melons (water)	H	August to October	4 to 5 lb.	September to December	E	July to October
Oats	D	March to June	2 bushels (b.c.)	March and August	H	March to April
Onions	B	March to May	20 lb.	March to July	D	March to April
Panicum	D	July to October	20 lb. (b.c.)	September to January	N	July to February
Potatoes	N	February and August	10 to 14 cwt.	August and February	D	Middle March and middle July
Rape	E	September	2 to 3 lb.	February to May	N	March and April
Rice	B or D	July	30 to 40 lb.	February to June	E	October to January
Rye	E	March to July	2 to 3 bushels	September to December	D or B	March and April
Sorghum	D	August to January	10 lb.	February to June	E	August to March
Sugar-cane	M	August and September	1,700 to 2,000 plants	September to December	D	July to September
Sweet potatoes	Q	September	2,420 plants	September to November	M	August to February
Teosinte	D	January, October, November	10 lb.	Sept., Oct., Nov.	Q	August to January
Tobacco	B	August and September	1 teaspoonful per 100 sq. ft.	August and September	D	July to September
Tomatoes	B	August to September	1 oz. to 1,500 plants	August to October	B	August to February
Turnips	D	Aug. to Oct., Jan. to March	2 lb. per acre	February to October	B	March to May
Turnips (Swede)	D	February to April	3 to 4 lb.	February to May	D	March to May
Vetches	D	March to June	1 bushel	Aug. to Oct., & Mar. to May	D	March to May
Wheat	D	March to June	¼ bushel	April to July	D	March to May

VEGETABLE GARDEN.

Artichoke (Globe)	N	May to September	5 oz. per perch	...	March to October	L	November and April
Artichoke (Jerusalem)	C	September	3 to 4 cwt. per acre	...	July and August	C	March and August
Asparagus	C	July and August	1 oz. to 60 ft. of drill	...	May to August	I	March and April
Beans (French)	S	August to May	1 qt. to 100 "	...	August to March	S	Jan. to Apr. and Aug. to Sept.
Beans (broad)	S	March and September	2 qts. to 100 "	...	February to July	I	March and April
Beans (Lima)	Y	August and November	...	...	September to December	S or Y	February to August
Beetroot	B or S	February to September	1 oz. to 50 ft. of drill	...	January to September	B or S	March to June
Cabbage	B	January to September	5 oz. per perch	...	All seasons	B	February to June
Capsicum and chillies	B	August to October	1 oz to 1,000 plants	...	August to October	F	August to October
Carrot	D	Nearly all seasons	1 oz. per 100 ft. of drill	...	...	A	March to June
Cassava	B	...	1,210 plants per acre	...	...	B	February to June
Cauliflower	U	Middle Jan. to middle Mar.	5 oz. per perch	...	December to March	U	March and April
Celery	Y	January and February	1 oz. to 2,000 plants	...	November to January	T & Y	March, August, and September
Chocos	D	August or September	Plant whole fruit	...	August to October	D	Nearly all seasons
Cress	H	August to November	...	...	Aug., Sept., to December	H	July to March
Cucumbers	C	August to November	1 oz to 125 hills...	...	August to January	K	March to September
Culinary herbs	N	March to May	Division of roots and seed	...	March to May	C	August to October
Egg-plant	K	September	1 oz. to 1,000 plants	...	September and October	B	March to July
Endive	B	February and March	1 oz. to 3,000 plants	...	February and April	K	February to October
Eschallots	B	Nearly all seasons	1 qt. of setts to 50 ft. of drill	...	All seasons	B	March to May
Kohl-rabi	B	Aug., Sept., Feb., April	3 to 4 lb. per acre	...	February to June	B	March to April
Leeks	B	April and May	About 4 lb. per acre	...	February to May	B	March to April
Lettuce	H	Aug., Sept., Feb., April	1 oz. to 3,000 plants	...	Spring and Autumn	B	Nearly all the year
Melons	H	August to November	1 oz. to 30 hills	...	Aug. to Nov., July to Mar.	H	July to March (rockmelon)
Marrows	H	August to November	1 oz. to 100 hills	...	Aug. to Jan., July to Mar.	H	July to March
Okara	C	September to November	1 plant per sq. yard	...	September to November	B & C	August to November
Onions	D	March, April, and May	1 oz. to 100 ft. of drill	...	March to July	N or B	March to April
Parsnips	D	March and April	1 oz. to 200 "	...	February to April	D	March to April
Pea-nuts	N	September to November	21,780 plants per acre	...	September to November	N	July to September
Peas	S	January to September	1 qt. to 75 ft- of drill	...	February, March, and June	S	March to June
Potatoes	N	February and August	10 to 14 cwt. per acre	...	Jan., Feb., Aug., and Sept.	N	Middle Mar., and middle July
Pumpkins	T	August to November	1 oz. to 50 hills	...	September to November	T	July to March
Rhubarb	I	May to August	1 plant per sq. yard	...	Autumn to August	I	February to June
Radish	D	All seasons	...	...	All seasons	D	February to November
Salsafy	F	March to August	1 oz. to 70 ft. of drill	...	March to August	F	March to April
Spinach (prickly)	I	March to May	1 oz. to 100 "	...	March to May	I	March to May
Spinach (round)	I	August and September	1 oz. to 100 "	...	August and September	I	July to September
Tomatoes	B & Y	August to November	1 oz. to 1,500 plants 3 ft apart	...	August to December	B & Y	July to March
Turnips	D	Aug. to Oct. & Jan. to Mar.	1 oz. to 150 ft. of drill	...	February to September	D	August to October
Turneric	N	...	7,260 plants per acre	...	...	Q	July to October





## NUTS.

[illegible]



## NORTHERN DISTRICTS (TROPICAL PRODUCTS).

Plant.	How to Sow.	When to Sow.	Amount of Seed or Plants Required.
FIELD CROPS.			
Arrowroot ... ..	C t	August to October ... ..	4,000 setts per acre
Cassava ... ..	c t	All seasons ... ..	1,400 plants ..
Castor oil ... ..	A d	Aug. to Nov., Mar. and April	25 lb. seed ..
Cotton (annual) ... ..	C d	Aug. to Sep., Mar. and April	4,000 plants ..
Cotton (perennial) ... ..	a	" " " " " "	880 plants ..
Cowpea ... ..	P	Sept., Oct., Jan. to March	12 lb. seed ..
Ginger ... ..	N t	August to November ... ..	15,000 setts ..
Jalap ... ..	N t	" " " " " "	15,000 setts ..
Maize ... ..	o	September to January ... ..	$\frac{1}{4}$ to $\frac{1}{2}$ bushel drilled, $1\frac{1}{2}$ bushels broadcast
Panicum ... ..	D or P	September to December ... ..	$\frac{1}{2}$ bushel seed per acre
Pineapples ... ..	J o	February and August ... ..	3,600 plants ..
Pigeon pea ... ..	C d	Aug. to Nov., Mar. and April	20 lb. seed ..
Peanuts ... ..	P t	Oct. to Dec., Mar. and April	2 bushels ..
Rice ... ..	B or D	December and January ... ..	1 to $1\frac{1}{2}$ bushels ..
Sorghum ... ..	D or P	October to March ... ..	$\frac{1}{4}$ bushel seed ..
Sunflower ... ..	C	Aug. to Oct., Jan. to March	$\frac{1}{2}$ bushel seed ..
Sessamum ... ..	S	" " " " " "	5 lb. seed ..
Sugar-cane ... ..	M	August to October ... ..	4,000 to 5,000 plants ..
Teosinte ... ..	D or P	October to March ... ..	$\frac{1}{4}$ bushel seed ..
Tobacco, sow ... ..	B	October to November ... ..	1 teaspoonful per 100 sq. ft.
Tobacco (cigar leaf), plant ...	b	December to January ... ..	7,500 plants per acre
Turmeric ... ..	N t	August to November ... ..	15,000 setts ..

## PLANTATION CROPS.

Allspice ... ..	f X	Sept., Oct., Feb. to April ...	108 plants per acre
Bananas ... ..	V	October to February ... ..	300 " " "
Cardamoms ... ..	l T	December to March ... ..	680 " " "
Camphor ... ..	f j	Sept., Oct., Feb. to April ...	200 " " "
Cinnamon ... ..	f X	" " " " " "	108 " " "
Cloves ... ..	f X l	" " " " " "	108 " " "
Cocoanut ... ..	X	September or March ... ..	48 " " "
Cocoa ... ..	f j l	Sept., Oct., Feb. to April ...	200 " " "
Copal gum ... ..	f X	" " " " " "	108 " " "
Coffee, sow ... ..	f	May to June ... ..	1 lb. seed to 25 sq. ft.
Coffee, Arabian, plant out	a	Sept., Oct., Feb. to April ...	881 plants per acre
Coffee, Liberian, " "	T or n	" " " " " "	680 " " "
Cubebs ... ..	k l	" " " " " "	800 " " "
Divi-divi ... ..	f X	" " " " " "	108 " " "
Fibres—			
Agaves (sisal) ... ..	T	September to March ... ..	680 plants per acre
Murva ... ..	A	" " " " " "	1,700 " " "
Manila ... ..	e	November to March ... ..	435 " " "
Ramie ... ..	A	Sept., Oct., Jan. and Feb. ...	1,700 " " "
Kapock ... ..	f X	September or March ... ..	50 " " "
Kolanut ... ..	f X	Sept., Oc., Feb. and March ...	108 " " "
Nutmegs ... ..	f X	Sept., Oct., Feb. to April ...	108 " " "
Oil palm ... ..	f X	" " " " " "	50 " " "
Pepper ... ..	k l	" " " " " "	800 " " "
Plaintain ... ..	V	October to February ... ..	300 " " "
Rubber, sow ... ..	f	Within 20 days of harvesting	
Para ... ..	j or X	September or March ... ..	50 to 200 " " "
Ceara ... ..	X g d	September to March ... ..	108 " " "
Rambong ... ..	h i	" " " " " "	27 " " "
African ... ..	j or X	" " or " " " "	100 to 200 " " "
Castilloa ... ..	j or X	" " " " " "	100 to 200 " " "
Sago palm ... ..	f X	Sept., Oct., Feb. to April ...	50 " " "
Tea ... ..	f A	" " " " " "	1,500 " " "
Vanilla ... ..	k l	" " " " " "	800 " " "

NORTHERN DISTRICTS (TROPICAL PRODUCTS)—*continued*.

Plant.	How to Sow.	When to Sow.	Amount of Seed or Plants Required.
--------	-------------	--------------	------------------------------------

## VEGETABLE GARDEN.

Beans—Lima, Tonga, Mauritius, &c.	Y m	August to November ...	1 lb. seed to 100 plants
Chocos ... ..	Y	August to Nov., and May...	Plant whole fruit
Cucumbers ... ..	H or Y	" ... ..	1 oz. seed to 100 plants
Egg plant ... ..	B C	" ... ..	1 " 1,000 "
Okra ... ..	B P	" ... ..	1 " 200 "
Pumpkins ... ..	T	" ... ..	1 " 50 "
Rosella ... ..	B A	" and May...	1 " 250 "
Tomatoes ... ..	B Y	" ... ..	1 " 1,500 "
Yams ... ..	A m t	September and October ...	50 setts per perch
Melons ... ..	H	September to November ...	1 oz. to 25 holes

## ORCHARD.

Avocado pear ... ..	f j	Sept. to Nov., Feb. and Mar.	200	trees per acre
Anise ... ..	f n	Sept. to Nov., Feb. and Apr.	435	" "
Algoraba bean ... ..	f X	Sept. to Nov., Jan. to Mar.	108	" "
Arnatto ... ..	A	Sept. to Nov., Feb. to Apr.	1,700	" "
Bullock's heart ... ..	f j	" "	200	" "
Bael fruit ... ..	f j	" "	200	" "
Bread fruit ... ..	f X	" "	108	" "
Citrus fruits ... ..	f X	" Feb. to Mar.	108	" "
Custard apple ... ..	f n	" "	435	" "
Carob bean ... ..	f X	" Feb. to Apr.	108	" "
Cocoa ... ..	f j l	" "	680	" "
Cassia bean ... ..	f X	" Jan. to Mar.	108	" "
Cherimoya ... ..	f n	" "	435	" "
Fiji almond ... ..	f or g X	" Feb. to Apr.	50	" "
Granadilla ... ..	Y	" "	400	" "
Guava ... ..	n	" "	435	" "
Gwango ... ..	j X	" Jan. to Mar.	50	" "
Horse-radish tree ... ..	f X	" Feb. to Apr.	108	" "
Jack fruit ... ..	f X	" "	50	" "
Kei apple ... ..	f j	" "	108	" "
Loquat ... ..	f X	" "	108	" "
Litchi ... ..	f X	" "	50	" "
Longan ... ..	f X	" "	50	" "
Mango ... ..	f or g X	" "	50	" "
Mulberry ... ..	h X	" "	108	" "
Mangosteen ... ..	f j	" "	200	" "
Mate tea ... ..	h X	" Jan. to Mar.	108	" "
Madagascar plum ... ..	f X	" Feb. to Apr.	50	" "
Natal plum ... ..	h n	" "	435	" "
Papaw ... ..	f or g T	" "	680	" "
Passion fruit ... ..	Y	" "	302	" "
Pomegranate ... ..	f n	June to Sept.	435	" "
Queensland nut ... ..	f X	Sept. " "	108	" "
Rose apple ... ..	f j	Sept. to Nov.	200	" "
Sour sop ... ..	f n	" "	435	" "
Star apple ... ..	f X	" "	108	" "
Tamarind ... ..	f X	" "	108	" "
Vi apple ... ..	f X	" "	50	" "
Whampee ... ..	f j	" "	200	" "
Whang-wee nut ... ..	f j	" Jan. to Mar.	200	" "
Yung-tau, or five corner ... ..	f j	" Feb. to Apr.	200	" "
Bamboo ... ..	h X	" Jan. to Mar.	108	" "
Shade and ornamental trees	f X or i	" Jan. to Apr.	27 to 108	" "
Timber trees ... ..	f X or i	" "	27 to 108	" "



## EXPLANATION OF SIGNS USED IN THE ABOVE TABLES.

- A—In rows 5 feet or 6 feet by 4 feet.  
 B—Sow in beds, and transplant.  
 C—In rows, 4 feet apart by  $2\frac{1}{2}$  to 3 feet in the row.  
 D—Sow broadcast or in drills.  
 E—In drills 3 feet apart. Thin out to 6 inches apart in the row.  
 F—In drills and thin out when strong enough.  
 G—Sow in beds and transplant to a nursery. When 15 inches high, transplant permanently in rows 6 feet each way.  
 H—In holes, 6 feet square; three seeds in a hole.  
 I—In drills 2 feet 6 inches apart. The setts 12 inches apart in the rows.  
 J—By suckers, and, if suckers are unobtainable, by tops.  
 K—In beds 6 inches apart.  
 L—Drills 3 feet apart each way.  
 M—By tops, if procurable, each with 4 buds, in a furrow, 1 foot deep. Cover with 1 inch of soil. The sett must be laid with the buds on each side. Fill in the furrow as the shoots grow. If tops cannot be got, make setts of the cane itself, each sett with four buds.  
 N—In drills 2 feet 6 inches apart. Setts 12 inches in the row.  
 O—In rows 6 feet apart, or sow in drills and thin out to 3 feet.  
 P—In drills 3 feet apart. Thin out to 1 foot in the rows.  
 Q—By suckers or runners, 3 feet apart and 18 inches in the rows.  
 R—By runners,  $3\frac{1}{2}$  feet by 15 inches.  
 S—In rows 2 feet apart and 6 to 8 inches in the rows.  
 T—8 feet apart in rows.  
 U—Sow in beds. Plant out in a small bed, 3 inches apart. When the plants are strong enough, plant out in trenches, well manured, and fill up as the plants grow above the trench.  
 V—By suckers 12 feet apart.  
 W—By cuttings or rooted plants, 6 feet in the rows, 6 feet apart.  
 X—20 by 20, or 30 by 30.  
 Y—On trellis, shed, fence, or wall.  
 Y1—On trellis, shed, fence, or wall, 12 feet apart.  
 Z—18 feet apart each way.

## EXTRA SIGNS USED IN THE TABLES OF TROPICAL AGRICULTURE.

- a*—7 feet apart in lines on the square or diagonal.  
*b*—Rows 3 feet 6 inches apart and the plants 18 to 22 inches apart in the rows.  
*c*—Cuttings 9 to 18 inches long, set on the slope, with about 3 inches above ground, at distances of 5 by 5, 6 by 5, or 6 by 6 feet.  
*d*—Three seeds in a hill or hole; subsequently thin out in favour of the strongest one.  
*e*—By suckers 10 feet apart.  
*f*—Sow in nursery beds and transplant into pits not less than 15 inches cube, in the field or orchard, when 12 to 18 inches high.  
*g*—Sow the seed at the stake where the trees are to remain.  
*h*—By plants or cuttings.  
*i*—40 by 40 feet apart, or at greater distances.  
*j*—15 by 15 feet apart in lines.  
*k*—Plant cuttings against living trees or artificial supports on which the vines can subsequently grow.  
*l*—Under permanent shade.  
*m*—Stakes required for climber.  
*n*—10 by 10 feet apart.  
*o*—In rows 6 feet apart, 2 feet apart in the rows.  
*p*—5 feet apart.  
*q*—25 feet apart.  
*r*—16 feet apart.  
*s*—8 feet by 10 feet.  
*t*—Trenched, well dug, or naturally loose ground necessary.

VOL. XXII., PART 5.

[MAY, 1909.]

Registered at the General Post Office for Transmission by Post as a Newspaper.]

---



THE

# QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE,

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOL. XXII. PART 5.

---

MAY.

---

By Authority:

BRISBANE: ANTHONY JAMES CUMMING, GOVERNMENT PRINTER.

1909.



## CONTENTS.

AGRICULTURE—								PAGE.
Distribution of Improved Seed Wheat	...	...	...	...	...	...	219	
Maize Culture	...	...	...	...	...	...	220	
Corn Judging	...	...	...	...	...	...	226	
Analysis of <i>Phalaris commutata</i>	...	...	...	...	...	...	228	
Method of Estimating the Yield of Cotton in the Field	...	...	...	...	...	...	229	
Rules for Judging Wheat	...	...	...	...	...	...	229	
Agricultural Credit Banks	...	...	...	...	...	...	230	
Winter Asparagus	...	...	...	...	...	...	233	
DAIRYING—								
The Dairy Herd	...	...	...	...	...	...	234	
Specifications for Erection of Piggeries	...	...	...	...	...	...	234	
THE SPIDER PEA	...	...	...	...	...	...	237	
THE HORSE—								
Care of Horses	...	...	...	...	...	...	238	
“THE AUSTRALIAN SUGAR JOURNAL”	...	...	...	...	...	...	239	
POULTRY—								
To Fatten Young Fowls	...	...	...	...	...	...	240	
Do Hens get too Fat to Lay?	...	...	...	...	...	...	240	
STATISTICS—								
Commonwealth Meteorology	...	...	...	...	...	...	241	
THE ORCHARD—								
How to Pulp Fruit	...	...	...	...	...	...	242	
Trapping Moths...	...	...	...	...	...	...	243	
HORTICULTURE—								
Flower Gardening, No. 16	...	...	...	...	The Editor	244		
Some Facts and Fancies of the Garden	...	...	...	...	A. Neate	249		
FORESTRY—								
Forests of China	...	...	...	...	...	255		
Forests and Moisture	...	...	...	...	The Editor	256		
TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1909	...	...	...	...	...	259		
CHEMISTRY—								
Analyses of Fertilisers	...	...	...	...	J. C. Brünnich	260		

**TROPICAL INDUSTRIES—**

PAGE.

Extraction of Oil from Seeds ...	...	...	...	...	...	262
New Fibre-extracting Machine ...	...	...	...	...	...	263

DESTRUCTION OF PRICKLY PEAR ...	...	...	...	...	...	264
---------------------------------	-----	-----	-----	-----	-----	-----

**GENERAL NOTES—**

Sparrows ...	...	...	...	...	...	265
How to Treat a Rusty Tank ...	...	...	...	...	...	267
Creation of a New Strawberry ...	...	...	...	...	...	267

**ANSWERS TO CORRESPONDENTS—**

Acacias and Poincianas...	...	...	...	...	...	267
<i>Setaria italica</i> ...	...	...	...	...	...	267
Ringworm on Horses ...	...	...	...	...	...	267
Ditch Millet ( <i>Paspalum scrobiculatum</i> ) ...	...	...	...	...	...	268
Tropical Clover ...	...	...	...	...	...	268
Analyses of Spear and Blue Grass and Molasses ...	...	...	...	...	...	268

**THE MARKETS—**

Prices of Fruit—Roma-street Markets ...	...	...	...	...	...	269
Southern Fruit Market ...	...	...	...	...	...	269
Prices of Farm Produce in the Brisbane Markets for March ...	...	...	...	...	...	270
Enoggera Saleyards ...	...	...	...	...	...	270

ORCHARD NOTES FOR JUNE ...	...	...	A. H. Benson, M.R.A.C.	271
----------------------------	-----	-----	------------------------	-----

FARM AND GARDEN NOTES FOR JUNE ...	...	...	...	...	273
------------------------------------	-----	-----	-----	-----	-----

LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES ...	...	...	I.
------------------------------------------------------	-----	-----	----

DEPARTMENTAL ANNOUNCEMENTS ...	...	...	...	...	VII.
--------------------------------	-----	-----	-----	-----	------

DIRECTIONS FOR FORWARDING SPECIMENS ...	...	...	...	...	VIII.
-----------------------------------------	-----	-----	-----	-----	-------



NOTICE.

Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,  
to cover postage.

To all other persons the annual subscription will be 10s., which will include postage.

All remittances should be made by postal notes or money orders, but where they are unobtainable stamps will be accepted, though the Department accepts no responsibility for any loss due to the latter mode of remitting.

For your convenience an Order Form is attached. A cross on each side of the Order Form indicates to the recipient that his subscription is again due.

Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

ORDER FORM.

To the Under Secretary, Department of Agriculture  
and Stock, Brisbane.

For the enclosed\*.....please  
forward me THE QUEENSLAND AGRICULTURAL  
JOURNAL for One Year.

Name.....

PLEASE WRITE PLAINLY. Address.....  
.....

Occupation.....

\* State amount according to above rate.

## Agriculture.

### DISTRIBUTION OF IMPROVED SEED WHEAT.

The following Bulletin has lately been issued by the Director of the Kansas State Agricultural College, U.S.A. :—

During the past 8 years hundreds of samples of wheat, secured from all parts of the world, have been planted and tested by the Experiment Station at Manhattan, Fort Hays, and McPherson. It has been the practice during the past 5 years, as soon as seed of these varieties were shown to be superior, to distribute it among the farmers in the State.

On account of its general adaptation, hardiness, and good producing qualities, as well as its excellent flour-making and bread-making qualities, the Kharkof variety has been chosen as one of the best varieties for general distribution, and it has been distributed in larger quantities.

The Kharkof wheat was imported from Russia by Prof. M. A. Carleton, Cerealist, U.S. Department of Agriculture. At the Manhattan Station the Kharkof wheat ranks first in average yield for 5 years, 1904-1908. It is also among the highest producers at the Fort Hays and McPherson Stations. Farmers from all over the State are reporting very favourably on the hardiness and productiveness of this variety. Among more than 100 reports received from growers who had secured seed from Manhattan, only two reported unfavourably, and one of these was located in South-eastern Kansas, really the soft wheat section of the State.

The Kharkof has also been shown to have excellent milling qualities, ranking with the best samples of other Turkey wheat more recently imported. Large quantities of the seed of this excellent wheat and smaller quantities of seed of other good producing varieties have been distributed to every county in the State.

There were 3,995 bushels distributed to 638 farmers in 99 counties from the Manhattan Station alone. The Fort Hays Station has distributed 3,980 bushels, mostly Kharkof, to 563 purchasers, mainly in the western counties of the State, and the McPherson Station has distributed small quantities of seed of some of the best producing varieties of hard red winter wheat.

Of the 1,200 farmers receiving the seed from the Experiment Station, probably two-thirds have continued the seed distribution work. The Agronomy Department has encouraged this by asking for reports and listing the growers for reference to those who make inquiry. In 1908 some fifty growers were listed as having some 20,000 bushels of this seed wheat for sale. This list was published and widely distributed through the work of the Farmers' Institute and the Agronomy Departments of this College. Many growers reported that their wheat had all been spoken for by their neighbours; others stated that they would need all the seed that they had produced for their own use.

Considering the facts stated above, it is believed to be a conservative estimate to assume that at least 160,000 acres of the Kharkof and other improved varieties of wheat are now growing in this State. At the rate of 25 bushels per acre, a 4,000,000-bushel crop of this improved wheat will be harvested next season, or enough seed, if carefully distributed, to plant one-half the total wheat acreage of the State.

Little of this improved wheat has, as yet, come to the mills, since it has been used largely for seeding purposes, but by the fall of 1910 it will come to the mills in a large quantity, and the problem of seed-wheat improvement in Kansas will have been solved.



The production by breeding and selection of varieties which are much superior even to the best samples which we are now able to grow and distribute is in active progress.

Of the hundreds of varieties of imported wheat tested at the several Experiment Stations of this State, comparatively few have proven superior. The Kharkof wheat grown in the State to-day is better than the original sample, being both purer and of better quality and of greater yielding capacity.

A. M. TENEYCK, Agronomist.

---

### MAIZE CULTURE.

Maize is more extensively grown in Queensland than any other cereal, the acreage being almost double that of wheat, and the product five times greater. There is, probably, no portion of the State where maize cannot be grown profitably, and that under the most varying conditions of soil and climate. Even on poor, thin soils, if they are properly prepared and cultivated, payable crops are produced, and this is mainly owing to the strong root system of the plant. Experiments have shown that the roots will strike downwards as far as 8 ft., yet the main bulk of the roots generally develop at a depth of 8 in. In experiments made in the United States, it was found that a dense network of feeding roots, reaching from row to row, completely permeated the whole soil area below the cultivated portion, and that the fourth inch of soil contains a larger amount of roots than the 3 in. above it, or the 4 in. below it, and nearly as much as both together.

The essential thing in the cultivation of maize is to keep the soil free from weeds, and covered with a soft soil mulch. There are some who advocate deep cultivation, but the results of fifty-six tests at seventeen Agricultural Experiment Stations in America have shown an average increase of 42 per cent. resulting from shallow cultivation as compared with deep cultivation. It has long since been determined that cultivation conserves soil moisture, and makes the ground warmer. At the Wisconsin Station cultivation 3 in. deep left the ground more moist below the cultivated layer than cultivation 1½ in. deep. If the methods of maize cultivation are based on the root development, it would seem that level cultivation 2 in. to 3 in. deep is most logical.

Maize succeeds best in Queensland on deep, well-drained, loamy soils, such as are to be found on our river flats, and on the volcanic soils of the West, and on the rich alluvial soils of the scrubs. The pioneer maize-growers grew splendid crops of "corn," as maize is universally called, on the newly-cleared scrub soils by very primitive means, and to the present day the same means have to be adopted on such lands, covered as they are for the first three years with innumerable stumps, and permeated by a net-work of roots. Here corn must be planted by means of the hoe, three or four seeds being dropped into a hole and covered by a backward stroke of the hoe. No after cultivation is possible, nor is it needed. During the first season, after the scrub has been burnt off, there are few weeds to trouble the crop, which grows with surprising rapidity, and gives heavy returns. But as soon as the land is clear of stumps, it is necessary to go in for improved implements and methods of cultivation.

### SELECTION OF SEED.

Too much care cannot be taken in the selection of seed. It is courting disaster to take seed indiscriminately from a bag. It should be only taken from the very best cobs, and from these the top and bottom ends should be discarded, and only the large, even seeds from the middle selected. After being sown the seed is often destroyed to some extent by bandicoots, but the depredations of these animals can be guarded against by soaking the seeds in tar.

*Plate XXVIII.*

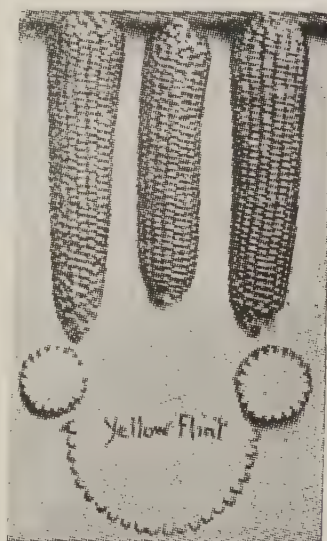


ROOT DEVELOPMENT—FORTY-FOUR DAYS AFTER PLANTING.





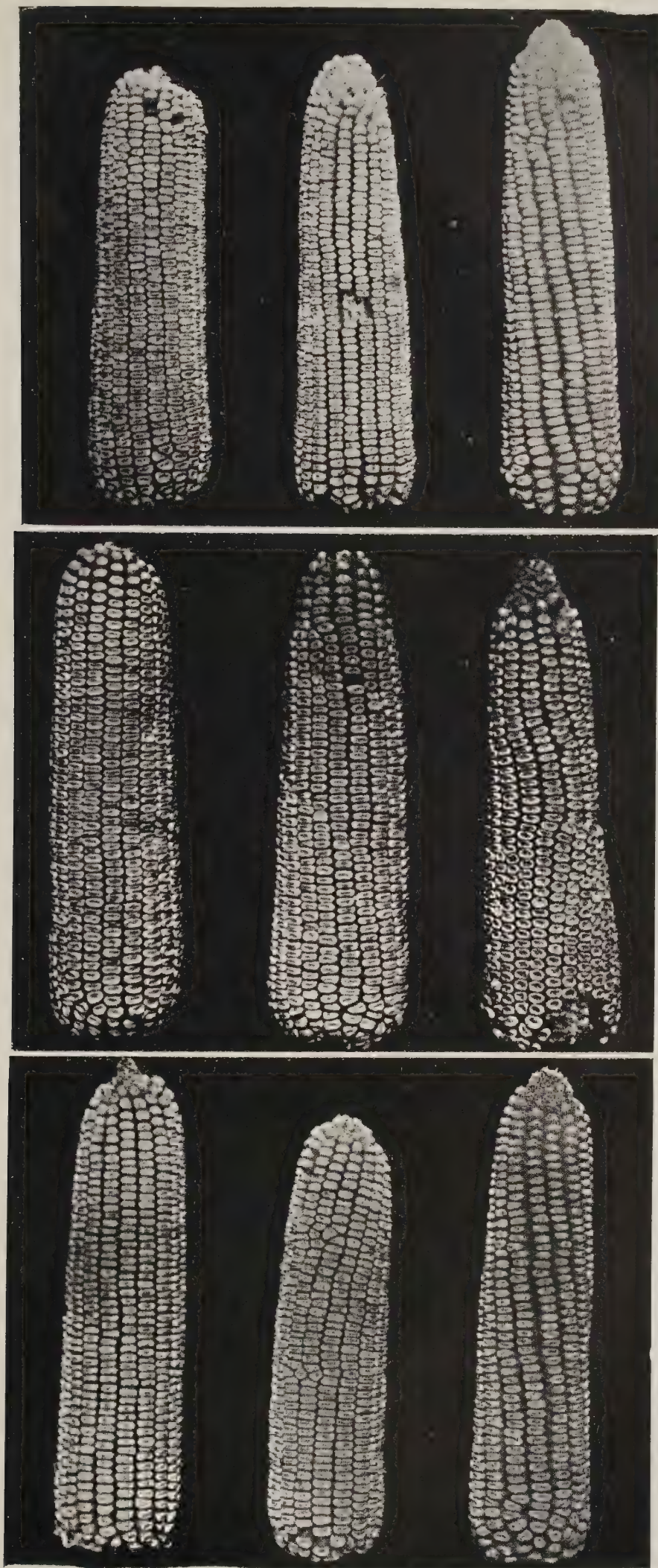
Plate XXIX.



MAIZE FROM WESTBROOK STATE FARM.







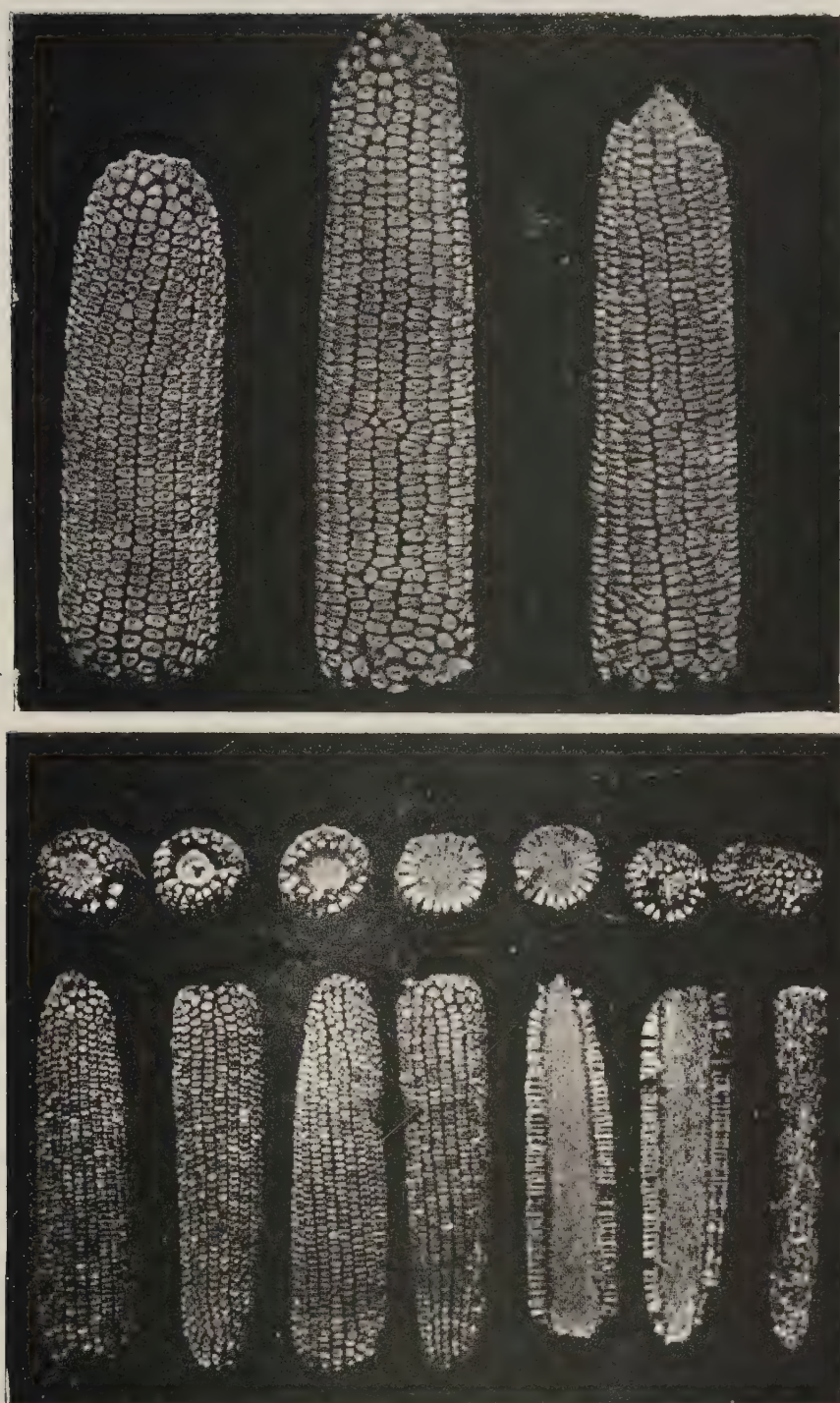
1. SPACE BETWEEN ROWS :  
 (a) Narrow ;  
 (b) Medium ;  
 (c) Wide space.

2. SHAPE OF EARS :  
 (a) Cylindrical—proper shape ;  
 (b) Partly cylindrical ;  
 (c) Very tapering.

3. DIRECTION OF ROWS OF KERNELS :  
 (a) Straight rows ;  
 (b) Rows turn to right ;  
 (c) Rows turn to left.





*Plate XXXI.*

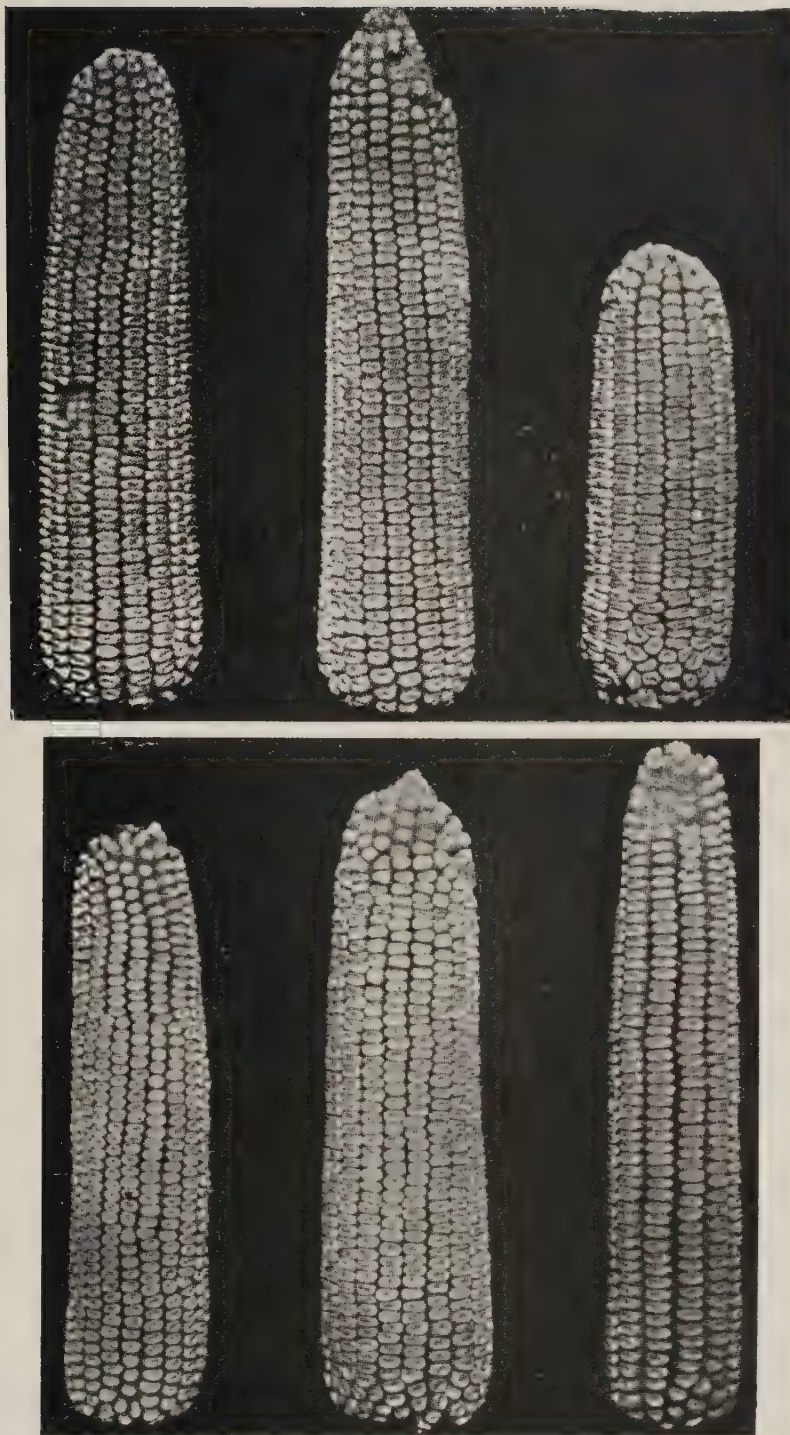
1. UNIFORM SAMPLE—

- (a) Too short for circumference.
- (b) Nearly correct length and circumference.
- (c) Immature.

2. BUTTS, TIPS, SIZE OF COB, DEPTH OF KERNEL, AND SHAPE OF EARS.





*Plate XXXII.*

1. LENGTH OF EAR—

- (a) Proper length and size.
- (b) Too long.
- (c) Too short.

2. CIRCUMFERENCE OF EAR—

- (a) Well-proportioned, proper circumference.
- (b) Too large for length.
- (c) Too small for length.





The variety to grow largely depends on the local rainfall, the soil and situation, and the time the crop takes to mature. The lateness or earliness of the local season must also be taken into account in choosing a variety, as the time it takes to mature will depend somewhat on these circumstances. In districts close to the coast, where there is a good rainfall and a rich soil, a large type of corn is most likely to prove successful and give a heavier crop. Typical of this class is the Hawkesbury Champion and Clarence River. Once away from the coastal district and the rich scrub lands, the seasons generally experienced demand a variety which will mature its grain quickly. Probably no better type of maize for this purpose than the Leaming may be found.

This earliness of maturing can only be obtained by selection in the field. The average farmer can improve the yield by choosing the finest cobs in his crop, especially those which show the largest number of rows, evenness of the rows, with the least space between them. These characteristics will, however, eventually be lost on the average farm, for the general farmer will never breed corn. Corn-breeding is a special industry in America, as it should also be here, and, when special varieties are wanted, adapted to any particular conditions of soil and climate, these strains must be obtained from the breeder. As a rule, the very best seed will not remain pure for more than four or five years. It then becomes necessary to again secure well-bred seed. The advantages of improved seed corn are numerous. For instance, improved corn tends to diminish the percentage of barren stalks, a most important matter, because such stalks represent a direct loss to the farmer. Statistics have proved that loss from this cause amounts to from 10 to 15 per cent. Again, in the average field, the ears of corn are not uniform in size, many being small and stunted, with few rows of kernels, and those wide apart. It is the province of the corn-breeder to increase the uniformity of the crop, to regulate the proportion of corn to cob, to fill out the ends, and increase the number of large kernels, all of which matters the general farmer has no leisure to attend to.

#### PREPARATION OF THE LAND.

The success of a corn crop depends largely on the proper preparation of the land, and few plants are more responsive to proper tillage. I have already shown how deeply the roots of the maize plant penetrate the soil. This, then, points to the advisability of not only ploughing the soil to a depth of 9 in. or 10 in., but also of sub-soiling down to 18 in. or 20 in., although the latter operation may not pay in the first season, but certainly would in two or three successive seasons.

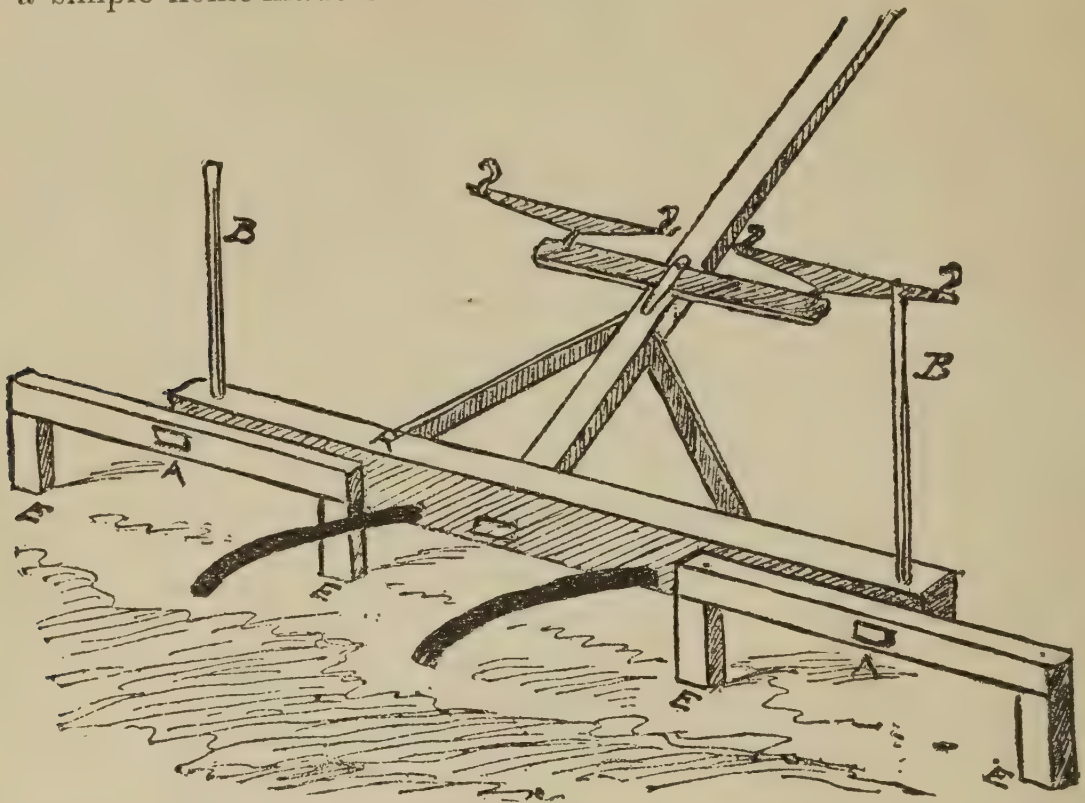
The ground having been thoroughly well ploughed in autumn should be left to lie fallow during the winter, exposed to the influence of the air, sun, rain, and frost. Then, in the spring, say about the end of August, it should be either cross-ploughed and well pulverised with a strong cultivator, set first to 8 in., and then crosswise to 10 in. or 12 in. deep. The main thing before planting is to secure a perfect tilth.

#### PLANTING.

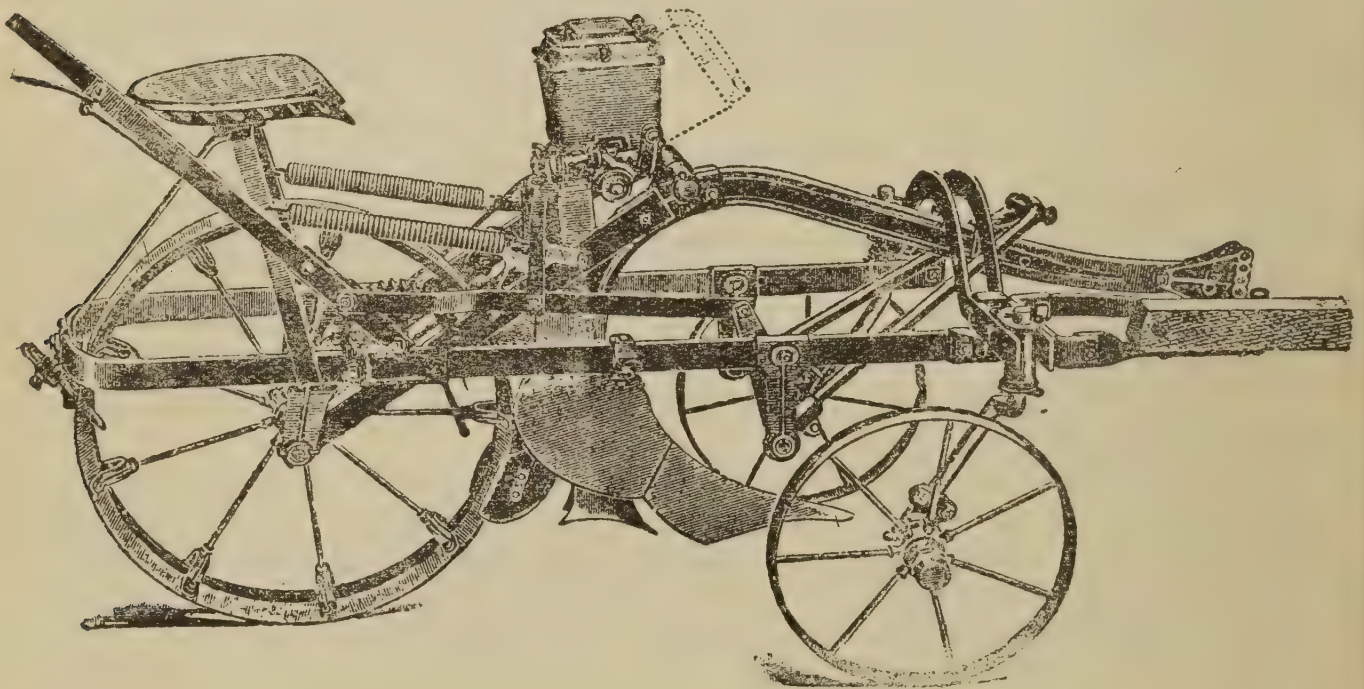
Planting may be begun in the South as soon as the frosts are over. In normal seasons that will be in September, but late frosts frequently occur in October. Fortunately, maize may be planted from September to January, so that, even if the first young crop is damaged by frost, a second can be at once planted, at the cost, however, of labour and lost time. Farther north, where frosts do not occur, the planting season is more extended, but generally the crop should be planted during the five months from September to January. A good plan is to plant one field in September, another in October, and then wait till the end of November to begin to plant the late crop. In that way one is fairly sure of a crop every year on at least two-thirds of the planted ground.



The seed may be drilled in or dropped by hand. The rows are first marked out by a simple home-made corn-marker.



To obtain the best results, the rows should be 4 ft. apart, and the plants 12 in. to 15 in. apart in the rows for small varieties, and 5 ft. apart and 18 in. in the rows for the tall-growing sorts.



When planting maize, it is customary to also plant in the same field pumpkins in every fourth or fifth row, and the combination of the two crops is very successful and profitable. There is plenty of time to till the land and keep the weeds in check before the pumpkin vines begin to run. Then, when they do this, they cover the soil, stop the growth of weeds, and keep the soil cool and moist during the great heat of summer. Finally, when the corn is harvested, the ground is covered with a vast number of pumpkins, valuable as food for stock, and generally saleable at a good price. For after cultivation, before the pumpkin vines cover the ground, there is nothing equal to a careful and thorough harrowing by means of lever harrows, with the teeth slightly standing backward. If this work is properly done, not one plant in a thousand will be injured, and all the rest will be greatly benefited. The thorough

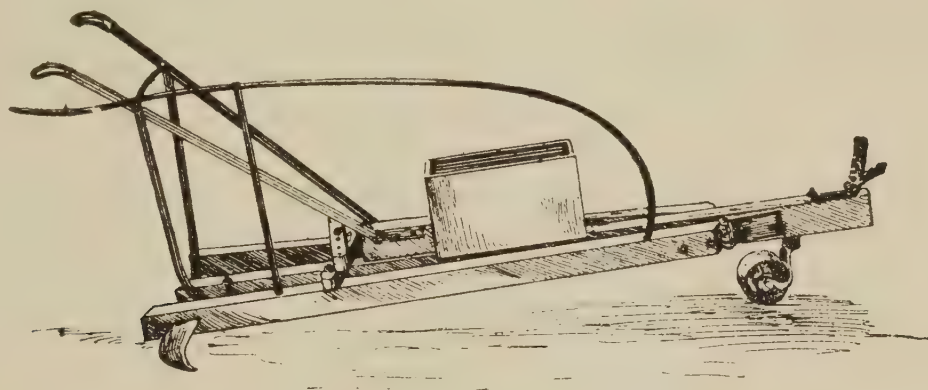


pulverisation of the soil at the young stems will facilitate the formation of roots, give increased circulation to them, and consequently quick, vigorous growth. Never be afraid to run the harrows over the young seedling corn. Later on, scarifiers may be used, but only at shallow depths, as previously stated. Now the crop may be left to itself.

When the cob has properly formed, it is sometimes customary to cut off the tops of the plants above the cobs, and utilise them as fodder, but it is questionable whether the amount of fodder thus obtained is worth the expense of cutting it.

#### HARVESTING.

In the United States, maize is harvested in a far different manner to the Queensland practice. There the crop is harvested for both grain and stover. Here we allow the crop to get thoroughly matured and dry. Then the cobs are pulled off by hand and carted to the barn, after which the dry stalks are hoed down and burnt. In America the corn is cut before the ears are thoroughly ripened, or soon after the kernels are well dented. The crop is cut by means of a machine drawn by two horses close to the ground by a combination of knives. The machine ties the stalks in sheaves, which are then stooked in the field and left until stalks and cobs are thoroughly dry. Then the whole is carted to the barn-yard, the cobs are removed, and the sheaves stacked for fodder.



As soon as the cobs are thoroughly dry, they are husked and put through a corn-sheller, which strips off the grain. There are machines which husk and shell in one operation, thus saving an immense amount of hand labour, but, strange to say, they are not universally used in Queensland.

Like all other plants, maize is subject to the attacks of insect and fungoid pests. The boll-worm, which also attacks cotton, is especially injurious. The caterpillars enter the silk end of the corn and live upon the kernels. The only remedies suggested are hand-picking and catching moths by lantern traps, or by poisoned baits. The weevil attacks the dry grain in the barn. One method of destroying it is to place a piece of rag impregnated with a small quantity of bisulphide of carbon on top of the corn in the bags. Bisulphide is poisonous and highly inflammable; it should, therefore, not be inhaled, and no candle or other light should be allowed near it. The grain may also be preserved in air-tight tanks. Before soldering or puttying the tank air-tight, a burning candle is placed in it. By its combustion it will use up in a few minutes all the oxygen of the tank, replacing it by carbonic acid gas. The candle will die out, and the air of the tank will be unfit for any living animal.

#### LISTING MAIZE.

There is a method of planting maize in the drier prairie States of America, particularly Kansas, Nebraska, and Iowa, known as "listing." The chief implement employed is a double mould-board plough, called a lister. It is worked usually by three horses, and throws the earth equally to the right and left. The implement generally has a subsoil attachment, a corn drill, and a contrivance for covering the seed. The lister cannot be used on unbroken sod



land, but it may be used on other land without previous ploughing, usually without. It simply strikes out furrows 4 ft. apart at the usual depth of ploughing, say 6 in., and the soil thrown right and left covers the intervening unploughed space with fresh earth. At the same time, the implement breaks up the subsoil and plants and covers the grain. The great advantage from a labour-saving standpoint of doing all the work of ploughing, subsoiling, planting, and covering the seed at one and the same operation, is apparent. The following rough sketch of a field in cross-section will make clear the condition of the listed field after the plants are well up from the ground:—



The subsequent treatment of the field planted as above does not differ materially from that given the crop as ordinarily planted. Afterwards the common two-horse cultivator is used, at first with a V-shaped box (A) about 3 ft. long, made of 2-in. plank, which moves with the implement, between the two cultivators, and prevents the earth as it falls into the furrow from covering the young plants. Before the field is "laid by" it is as level as though the grain had been planted on the surface. This method is best adapted to level black soil lands.

The advantages of listing are:—(1) Listed corn, having its roots in the deeper undersoil, is not so affected by drought as that which is surface planted; (2) the cost of growing the plant is reduced by one-fourth to one-third; and (3) the listed field gives a larger yield than that obtained by the common methods of planting.

#### COST OF GROWING MAIZE.

Mr. W. D. Lamb, of Yangan, an experienced maize-grower, sets down the cost of growing 1 acre of maize, yielding a 40-bushel crop, as follows:—

	Dr.	£	s.	d.
Rent of land	...	0	10	0
First ploughing	...	0	4	0
Second ploughing	...	0	3	0
Harrowing	...	0	1	0
Planting	...	0	1	6
Harrowing twice, at 9d.	...	0	1	6
Disc harrowing twice	...	0	2	0
Pulling maize	...	0	3	0
Carting maize	...	0	2	6
Husking and threshing 40 bush. at 1½d. per bush.	...	0	5	0
Drawing to rail	...	0	3	6
Ten bags at 5d. each	...	0	4	2
Seed maize	...	0	0	6
Balance	...	2	8	4
		£4 10 0		

Cr.

By 40 bushels maize, at 2s. 3d. per bushel ... £4 10 0

This estimate is, of course, subject to modification, as the price of maize fluctuates with the supply. At the present time of writing maize is worth 4s. per bushel; at the same time, farm wages have been considerably raised of

late, both of which are factors in increasing the cost of production, and in increasing the monetary return. Again, improved methods of cultivation have raised the yield of grain per acre, and although statistical returns may show an average yield of 20 bushels per acre, yet 50, 60, and 80 bushels are frequently obtained in many parts of the State.

#### CORN STOVER.

Australian farmers are too apt to grow maize for grain only. If the grain, owing to dry weather, or from some other cause, at tasselling time, does not form, or is pinched, they are content in many cases to let their crops go to waste. This is utterly wrong, especially since the advent of the silo. Fodder in the shape of stover—that is, the ripened or nearly ripened maize stalks—appears to be generally neglected, the reason being that farmers differ in their opinions as to the feeding value of the stalks. Some maintain that they are absolutely valueless, and that the best use that can be made of them is to burn them in the field. Others admit that they have about one-half the feeding value of hay. The fact is, that the feeding value of stover depends upon its condition when cut, the quantity fed, and the method of feeding, whether alone or in combination with other forage. A large number of analyses of corn-stover have been made, and experiments in feeding dairy stock have shown that stover rations have produced nearly or the same quantity of milk as the hay ration, the stover being equal in feeding value to oaten straw. As a matter of fact, stover should not be fed alone, but in combination with some other feed, forming what is known as a balanced ration. Alone, it lacks the sweet smell and flavour of hay; it is also hard, and tends to make the mouths of the cattle sore; for this reason they soon reject it. The proper plan is to chaff it, damp it, and mix it with other fodder, when the whole will be consumed by any stock. To secure good stover, allow the corn to stand in the field till the grain begins to harden and the bottom leaves are turning yellow. Then cut it and place in shocks of medium size, and let it dry out thoroughly. This will take about 5 or 6 weeks. After that it can be placed in a stack or rick. Running the crop through a husker and shredder is an ideal way of taking care of corn fodder.

#### CORN STOVER IN THE SILO.

We rarely hear of a maize-grower in Queensland harvesting his grain and then ensiling the dry stover. Some excellent samples of stover silage have been made at the State Farm at Hermitage. This was exhibited at Bowen Park Exhibition in 1903, and the farmers thought highly of it, but being averse to experimenting, the lesson was lost on the majority.

#### HOW MUCH WILL CORN SHRINK?

All farmers are aware that the longer they keep their corn the lighter it will get, and hence it is to their advantage to get rid of the new crop as quickly as possible, unless in the face of a rising market. Some years ago an experiment was made by Professor Atkinson at the Iowa (U.S.A.) Experiment Station to ascertain the amount of moisture contained in a cob of corn. A crib was constructed upon the platform of a pair of scales. Seven thousand pounds of corn were husked and placed in the crib. Once each week for a year it was weighed. During the first 3 months the loss was 630 lb., or 9 per cent. of the original weight. During the next 3 months the loss was 390 lb., or 5 per cent. of the original weight. During the next 3 months the loss was 220 lb. And the last 3 showed a further loss of 190 lb. The loss during the year was 1,430 lb., or a trifle more than 20 per cent. This means that a bushel of corn weighing 80 lb. when husked will weigh 64 lb. at the end of the year. The general rule for estimating the shrinkage of maize was to put the loss at from 7 to 8 per cent. From an experiment, however, made by a most methodical farmer in the United States, a new light is thrown on the subject. He weighed one crib of corn when he put it up. The first load was cribbed on the 9th



October, and the last on the 22nd October. The total amount of corn cribbed was 34,970 lb. The first load was hauled out on the 8th January, and the last on the 1st of February. The total hauled out was 29,995 lb., showing a shrinkage of 4,995 lb., or 14 per cent. It would be interesting if such experiments were made by practical men in Queensland. The climatic conditions being somewhat different here to those of parts of the United States, it might be shown that a lesser, or possibly a greater, shrinkage would be shown.

GROWING MAIZE FOR ENSILAGE.

Maize intended for silage should be planted in drills 4 ft. apart, and the plants 15 in. apart in the rows. Allow the maize to cob, and when the kernels have reached the "glazed" stage cut for the silo. By putting it away too young, and before the plants have cobbed, the silage will be bad, and the silos filled with some tons of matter containing no nutriment, such as water, &c. The amount of fodder per acre, if harvested at the proper stage, will amount to from 10 to 15 tons.

MAIZE ACREAGES FOR VARIOUS SILOS.

In reply to a question as to what is the estimated size of silo needed, and the number of acres of maize required for a given number of cows, for a feeding season of 180 days, a member of the Kansas Dairymen's Association said:—

I have arranged the figures in the following table:—

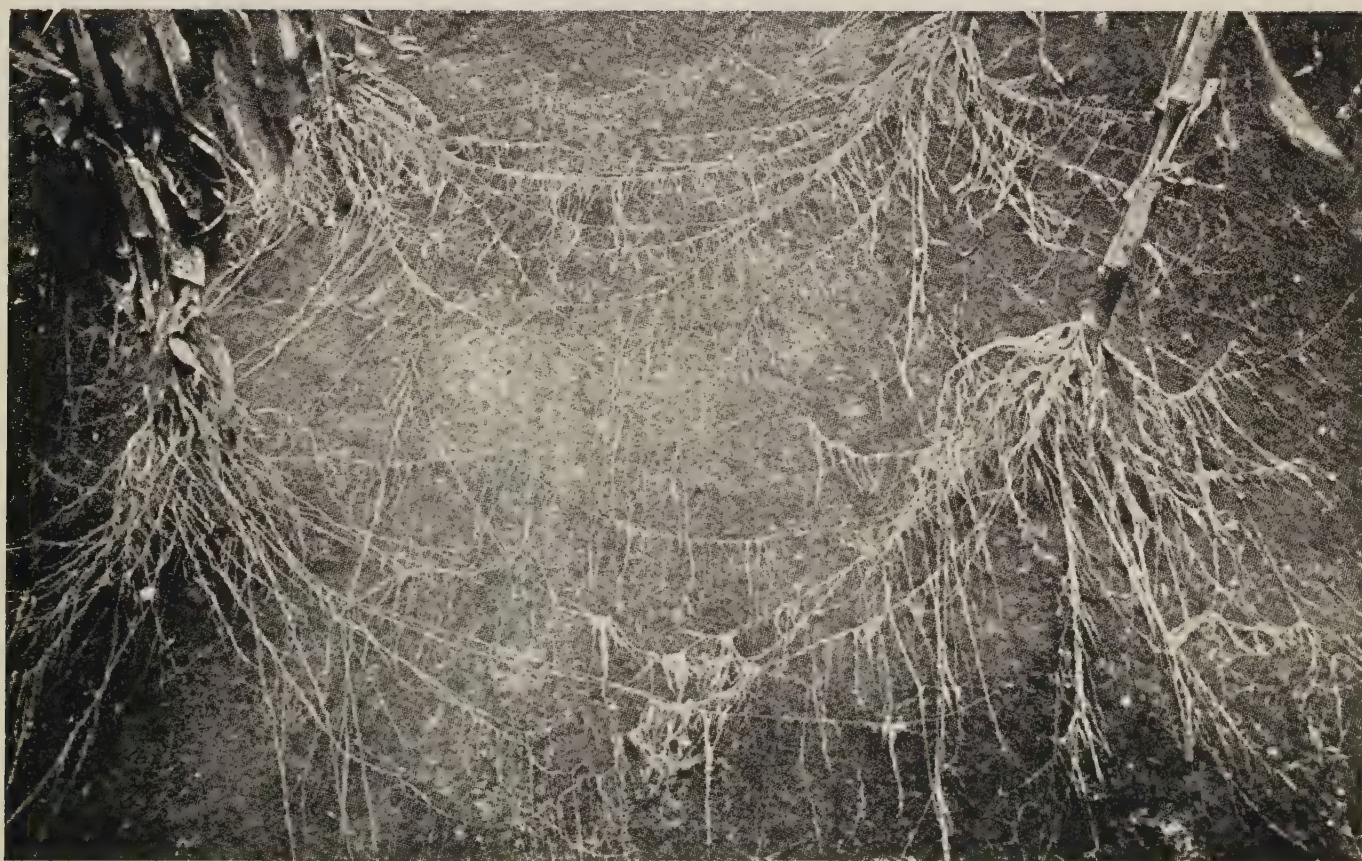
No. of Cows.	Estimated Consumption of Silage Tons.	Size of Silo Needed. Diam. Height.	Average Acres Maize Needed.
6	20	9 x 20 10 x 16	1 to 2
9	30	10 x 22 11 x 20	2 to 3
13	45	10 x 29 11 x 25 12 x 22	3 to 4
21	74	13 x 20 11 x 37 12 x 32 13 x 29 15 x 24 16 x 22	5 to 6
25	90	12 x 38 13 x 33 14 x 30 15 x 27 16 x 25	6 to 7
30	108	13 x 38 14 x 34 15 x 30 16 x 28 17 x 26	8 to 9
35	126	15 x 35 16 x 31 17 x 29	9 to 10
40	144	16 x 35 17 x 31 18 x 29	10 to 11
45	162	18 x 32 19 x 29	11 to 12
50	150	17 x 38 18 x 34	12 to 13

CORN JUDGING.

There is an excellent chapter on corn-judging in an exhaustive work on corn, published by the Orange Judd Company, Chicago, U.S.A. The following is a short summary of it, which should prove useful to judges at shows in Queensland:—

The great object which the judge has in mind is to select that sample of corn for first place, which, in his estimation, is best for seed purposes—namely,



*Plate XXXIII.*

1. PROPER AND IMPROPER SHAPES OF KERNELS.

At left, kernel proper wedge shape ; second, kernel square ; third, kernel too nearly round.

2. ROOT DEVELOPMENT OF CORN IN THE FIELD.

Soil washed off only to the depth the corn was cultivated.





which will, if planted in the ensuing spring, give the greatest profit per acre in the district in which it is grown.

THE SCORE CARD.—There are certain general points in all varieties of corn which must be taken into consideration by the judge and breeder, and this has led to the formulation of these points in a so-called score card, as here given :—

Score Card for Corn and Explanation of Points.

	Points.
1. Trueness to type or breed characteristics ... ..	10
The ten ears of the sample should possess similar or like characteristics, and should be true to the variety which they represent.	
2. Shape of ear ... ..	10
The shape of the ear should conform to variety type, tapering slightly from butt to tip, but approaching the cylindrical.	
3. Colour—(a) Grain ... ..	5
„ (b) Cob ... ..	5
The colour of the grains should be true to variety and free from mixture, with the exception of a few varieties. White corn should have white cobs, yellow corn red cobs.	
4. Market condition (vitality, maturity, &c.) ... ..	10
The ears should be sound, firm, well-matured, and free from mould, rot, or insect injuries.	
5. Tips ... ..	5
The tips of the ears should not be too tapering, and should be well filled with regular, uniform kernels.	
6. Butts ... ..	5
The rows of kernels should extend in regular order over the butt, leaving a deep depression when the shank is removed. Open and swelled butts are objectionable.	
7. Kernels—(a) Uniformity of ... ..	10
„ (b) Shape of ... ..	5
The kernels should be uniform in size, shape, and colour, and true to the variety type. The kernels should be so shaped that their edges touch from tip to crown. The germ or chit and the tip portions of the kernels are the richest in protein and oil, and hence of the highest feeding value. For this reason, the germ should be large, and the tip portion should be full and plump.	
8. Length of ear ... ..	10
Northern sections, 8½ in. to 9½ in.; central sections, 8¾ in. to 9¾ in.; southern sections, 9 in. to 10 in.	
9. Circumference of ear ... ..	5
Northern sections, 6½ in. to 7 in.; central sections, 6¾ in. to 7¼ in.; southern sections, 7 in. to 7½ in.	
10. Space—(a) Furrow between rows ... ..	5
„ (b) Space between kernels at cob ... ..	5
The furrows between the rows of kernels should be small. Space between the kernels near the cob is very objectionable.	
11. Proportion of corn to cob ... ..	10
The proportion of corn to cob is determined by weight. Depth of kernel, size of the cob, and maturity affect the proportion.	
Total ... ..	100

RULES TO BE USED IN JUDGING.

1. *Length of Ear*.—The deficiency and excess in length of all ears not conforming to the standard shall be added together, and for every 2 in. thus obtained a cut of 1 point shall be made.

2. *Circumference of Ear*.—The deficiency and excess in circumference of all ears not conforming to the standard shall be added together, and for every



2 in. thus obtained a cut of 1 point shall be made. Measure the circumference at one-third from the butt to the tip of the ear.

3. *Proportion of Corn to the Cob*.—The percentage of corn should be from 86 to 87. In determining the proportion of corn to cob, weigh and shell every alternate ear in the exhibit. Weigh the cobs, and subtract from the weight of the ears, giving the weight of the corn. Divide the weight of the corn by the total weight of ears, which will give the percentage of corn. For each percentage short of standard, a cut of  $1\frac{1}{2}$  points shall be made.

4. In judging corn, a red cob in white corn, or a white cob in yellow corn, shall be cut at least 2 points. For one or two mixed kernels a cut of  $\frac{1}{2}$  point shall be made. Kernels missing from the ear shall be counted mixed. Difference in shade or colour, as light or dark red, white or cream colour, must be scored according to variety characteristics.

5. *Exposed Tips*.—Where the full diameter of the corn is exposed, a cut of 1 point shall be made, and a proportionate cut as the cob is less exposed. Regularity of the rows near the tip, and the size and shape of the kernels, must also be considered in scoring tips.

6. *Scoring Butts*.—If the kernels are uniform in size, and extend over the butt in regular order, give full marking. Small and compressed or enlarged or open butts are objectionable, as are also those with flat, smooth, short kernels, and must be cut according to the judgment of the scorer.

7. Each exhibit should consist of ten ears of corn.

*Kernel Shape*.—The shape of kernel varies with different varieties, but in general there are certain conditions of shape that all kernels must fill. Such kernels fit around the cob tightly, and do not leave a space at the tip, nor a deep furrow between the rows of kernels. A broad, square kernel is usually shallow, and only a few rows of kernels grow on each cob. This means a small percentage of corn to cob. On the other hand, a well-shaped kernel is usually found on an ear with a large number of rows, and results in a large percentage of corn to cob. The sides of the kernels should be straight.

#### ANALYSIS OF *PHALARIS COMMUTATA*.

The *Phalaris commutata*, or Canary Grass, which has been received with great favour in this State, appears to be equally acceptable to the farmers in Cape Colony. A sample was obtained from a farmer at Waverley, which had grown to a height of 4 ft., and was unaffected by frosts. Part of this was analysed with the object of ascertaining whether the grass was worth cultivating as a fodder plant, in view of the fact that the seeds imported from Australia cost the high price of one penny each.

The composition was found to be as shown in the first line of the following table, the results of analyses of other grasses being given for the sake of comparison, and which are taken from Dietrich and Koenig's "Futtermittel," vol. 1, 1891 edition. In all cases the plants were in the air-dried or "hay" condition:—

	Moisture.	Proteins, N.X. 6.25.	Fat.	Ash.	Total Carbo-hydrates (including Fibre).	Fibre.	FUEL VALUE CALORICS PER LB.		Nutriment Ratio.
							Including Fibre.	Excluding Fibre.	
<i>Phalaris commutata</i> ...	13.77	10.37	2.94	14.60	58.32	23.96	1369	973	4.0
Italian Grass ...	14.30	9.54	2.91	8.62	61.63	19.48	1427	1073	5.4
Perennial Rye Grass ...	14.30	10.29	2.70	8.85	63.91	28.68	1461	939	4.0
<i>Phalaris canariensis</i> ...	14.15	17.50	2.05	7.47	58.83	40.13	1472	742	1.3
Timothy Grass ...	14.30	6.31	1.93	4.29	73.17	28.25	1525	1010	7.8
Kentucky Blue Grass ...	14.30	9.75	2.29	5.52	68.14	33.88	1510	993	4.1

METHOD OF ESTIMATING THE YIELD OF COTTON IN THE FIELD.

To estimate the yield of cotton from the plants in the field, the following directions, says Mr. J. C. Crawford, Special Agent, U.S. Bureau of Entomology, will be found useful:—

Determine the average number of sound bolls per plant by counting the number of such bolls on some five adjacent plants in at least three separate places in the field, and dividing the total number of bolls counted in this manner by the total number of plants examined. Where the field is very large or contains different soils, more than three places should be selected for counting. In the first column of the following table find the distance between the plants in the field, the crop of which is to be estimated. Then refer to the number on the same line in the following column, headed by the size of bolls to which the variety planted belongs. Dividing the average number of bolls per plant in the field by the number found in this manner in the table will give the fraction of a bale per acre that will be produced.

*Example.*—If, in the case of a small-boll variety like the King, the average number of bolls per plant is found to be 10, and the plants are put in at a distance of 2 ft. in rows 4 ft. apart, the amount of the prospective yield per acre will be 10 divided by 25·4, or 0·39 of a bale. In using this table, due allowance must be made for a poor stand:—

NUMBER OF COTTON BOLLS PER PLANT OF VARIOUS CLASSES REQUIRED AT CERTAIN DISTANCES TO PRODUCE A BALE PER ACRE WHEN COTTON GIVES 33½ PER CENT. OF LINT.

Distance between Plants in feet.	Number of Plants per acre.	Large Bolls, 50 to 65 per lb.	Medium-sized Bolls, 70 to 80 per lb.	Small Bolls, 85 to 100 per lb.
1 × 3	14,520	5·9	7·7	9·5
1 × 4	10,890	7·9	10·3	12·7
1 × 5	8,712	9·8	12·9	15·9
1 × 6	7,260	11·8	15·4	19·1
1½ × 3	9,680	8·9	11·6	14·0
1½ × 4	7,260	11·8	15·4	19·1
1½ × 5	5,808	14·8	19·3	23·8
1½ × 6	4,840	17·8	23·2	28·6
2 × 2	10,890	7·9	10·3	12·7
2 × 3	7,260	11·8	15·4	19·1
2 × 4	5,445	15·8	20·6	25·4
2 × 5	4,356	19·7	25·8	31·8
2 × 6	3,630	23·2	30·9	38·4
3 × 3	4,840	17·8	23·2	28·6

RULES FOR JUDGING WHEAT.

Exhibits of wheat should form a prominent feature at every agricultural show; but, as a rule, they do not. Every prominent grower in a cereal-producing district within a reasonable radius of where the show is being held, should compete in the section, so as to foster a deeper interest in the improvement of this important product. While hand-picked samples of grain, within certain limitations, may be accepted without objection, it would be more satisfactory to give prizes to growers who are able to produce five or six bags of grain similar in every respect to those which gained the awards. A very important matter in regard to judging wheat at shows is the recording of the weight per bushel of each of the competitive entries. Some judges decide on the basis that the heaviest bushel of wheat should win the prize. This reasoning is hardly sound, for other qualifications should also be considered, though undoubtedly weight is an important point. But if weight alone counted, then Algerian wheat, which, when well grown, is plump, bright coloured, comparatively hard, and weighs wonderfully well, would rank high, whereas it is of little use for milling purposes, and is really more suited for



pigs and poultry than flour-making. A more modest-looking grain, weighing less per bushel, may be eminently suitable for making the best flour, but the deficiency in weight, if undue importance were attached to that point, might, and probably would, result in it being neglected in favour of a more showy and bulky variety.

With regard to rules governing wheat competitions, Mr. Hugh Pye, Principal of the Dookie Agricultural College, expresses the opinion that at a suitable time previous to the show season samples of all wheats intended for competition should be placed in the hands of the Chemist for Agriculture, so that his staff may be in a position to supply all necessary information in regard to milling qualities, nature, and percentage of gluten, also other qualities which can best be determined by scientific test. Only about 2 lb. or 3 lb. of wheat would be required for this purpose, and only a few bushels need be sent to the show. But a guarantee should be given by the exhibitor that he had available several bags of exactly similar wheat. The judges at the show would then determine the weight per bushel of the grain, brightness of sample, whether clean, well-grown, &c., and, with the information obtained from the Chemist for Agriculture, award the prizes. Mr. Pye also points out that proper provision for measuring a bushel of wheat is seldom made. Generally, one of the judges has to struggle with the bag, and from it let the wheat pour into the bushel measure. But unless great care be taken to manipulate each bag in exactly the same way—and that is well-nigh impossible—there may be a difference of 1 lb. in the weight of a measured bushel. The proper way is to place the wheat in a hopper with sloping sides and having a shoot beneath, from which the wheat could pour at an even flow. The flow of grain should be cut off immediately it had run the appointed time, and then a clean strike could be made, and the grain weighed.—“Australasian.”

---

### AGRICULTURAL CREDIT BANKS.

The Board of Agriculture and Fisheries, England, has issued a leaflet explaining the formation and operation of agricultural banks which, the leaflet points out, are co-operative societies through which farmers in a small way of business may obtain advances of money for useful purposes at a reasonable rate of interest. The following information concerning such banks is interesting by way of comparison with the working of our Queensland Agricultural Bank, which also was established for the purpose of assisting new settlers to make necessary improvements on their selections:—

Some people may be inclined to question the wisdom of supporting or encouraging any system which makes it easy for a man to conduct his business with borrowed money. This idea, however, is based upon a misconception. The wisdom of borrowing depends mainly upon the purpose for which the money is borrowed, and the possibility of borrowing upon reasonable terms is generally a question of the security which the borrower can offer.

Credit is at the foundation of modern business methods. Most public companies work with borrowed money, and so long as the company can show good security for its liabilities nobody questions the soundness of the principle.

A business man of any standing in the commercial world experiences little difficulty in obtaining temporary advances of money to meet special requirements. But the small man in an agricultural community does not, as a rule, possess the same facilities.

In the days when private banks were scattered up and down the country the position was somewhat different. A trustworthy man could then more easily obtain a credit accommodation merely on the security of his character and position. But with the gradual absorption of private firms into large joint-stock banks conditions have changed. The small farmer, the labourer



with his allotment, the market gardener, and the village tradesman, may not be in a position to borrow money through the ordinary channels of credit, because ability, experience, and honesty of character do not necessarily constitute a sufficiently acceptable security for an advance. It is such persons that a credit bank is intended to benefit.

A credit bank, however, is not a philanthropic institution, but a society based and conducted strictly upon business principles. The distinctive features of a credit bank are—

- (i.) It is co-operative—its key-note being “self-help.”
- (ii.) It is local—its members living within a small area and being well known to one another.

These two features will become clearer when we proceed to consider its

#### *Constitution and Operations.*

The village or parish is the most convenient unit of area for a credit bank. The intending members form themselves into a society which adopts rules and is duly registered by the Registrar of Friendly Societies.

The credit bank appoints its officers and committee of management, and, as soon as it is properly constituted and registered, is in a position to borrow money on the joint security of its members. This money it lends out to those of its members who are at the moment in need of ready money.

Credit banks do not distribute dividends, and, the expenses of management being very small, money can be lent at a low rate of interest, and this is the main object for which the bank is formed.

The wisdom of borrowing, it has been stated, depends upon the purpose for which the money is borrowed. The credit bank will only lend money for purposes of production or economy. This, however, allows it a wide field of action. To give but a few examples of the useful objects for which money might be advanced there may be mentioned the purchase of implements, seeds, manure, poultry, &c., or the erection of a fowlhouse, greenhouse, or pigsty. A member who wishes to borrow money must state the purpose for which he requires it, and must undertake to apply it to that particular purpose. It will then be within the discretion of the committee to decide whether the loan shall be granted or not.

A credit bank can only lend to its own members, and its success will depend upon its admitting as members only those whose industry, honesty, and integrity are beyond question. A man who possesses these qualities should have no difficulty in becoming a member of a credit bank, or in obtaining from it an advance of money for any useful and productive purpose. The bank will, however, require him to furnish sureties for its repayment.

There can be no more thoroughly democratic institution than a credit bank. It elects its officers and committee to manage its affairs, but the action of these officers will be subject to vigilant checking, and it will be to the interest of every member to see that the character of the membership is strictly maintained, and that the affairs of the bank are conducted in an efficient and business-like manner.

This interest in good management will be the more vital because a credit bank of this type must necessarily be conducted upon the principle of the

#### *Unlimited Liability*

of its members for the money raised by the society.

Lest this should cause any misgivings as to any risk incurred by the individual members, it should be pointed out that the risk may be most effectually guarded against. The possibility of loss is in any case very remote, owing to the effective control which the members can exercise over all transactions of the bank, and it is reduced to practically nothing by adopting a rule limiting the amount of money that can be lent either in all or to any one member each year. Section 46 of the Friendly Societies Act provides that a



society shall not make any loan to a member on personal security beyond the amount fixed by the rules, or make any loan which together with any money owing by a member to a society exceeds £50.

On the other hand, it is just the security of such unlimited liability which enables the society to borrow money without trouble on advantageous terms.

How very remote the risk of loss really is may be judged from the fact that in Germany, where there are between 4,000 and 5,000 societies of the Raiffeisen Union proper, in addition to a much larger number similarly organised, it is said that no depositor or other creditor has lost a farthing since the movement was started in 1849.

In Ireland an almost equal immunity from loss is claimed by the Irish Agricultural Organisation Society, which has about 300 affiliated credit banks; and the few existing credit societies in England can tell the same story.

#### *Deposits.*

To every credit bank there should be attached a department for receiving on deposit the savings of its members. The money thus received would to some extent supplement that borrowed by the society, and would assist it in its lending operations.

#### *Central Bank.*

As credit banks are started in various localities they will strengthen their position and increase their resources by uniting to a central bank. Such central bank could then receive on deposit any surplus funds from the local banks, and assist them if necessary by making advances. It would, in fact, stand in somewhat the same relation to the local credit banks as these would to their individual members. The principle of unlimited liability, however, which is essential in the case of the separate banks, would be generally unsuitable as regards their relation to the central bank. In connection with the village co-operative credit societies affiliated to the Agricultural Organisation Society, a Central Co-operative Agricultural Bank has already been formed.

#### *Small Holdings and Allotments.*

The useful part which credit banks may play in the successful cultivation of small holdings and allotments has been recognised by Parliament, which has included in the Small Holdings and Allotments Act of 1907 certain provisions relating to these and other co-operative institutions.

County councils are given power under the Act to promote the formation and extension of credit banks, and they may, with the consent of the Local Government Board, assist such societies by making grants or advances upon such terms and such security as the council think fit. Even if they do not themselves lend money, county councils may guarantee advances made to the credit bank from other sources. The credit of a county council being first-class security, this provision should prove quite as useful in practice as the one enabling the councils to advance money.

The recognition of the principle of credit banking in an Act of Parliament, added to the experience of Continental countries extending over half a century, during which the system has been thoroughly tested, should be a sufficient guarantee of its soundness and utility, and it may with confidence be expected that the spreading of information on the subject will be accompanied by a steady increase in the number of credit banks, which, wherever established, have been attended with such signal success.

Full information as to the proper procedure can be obtained from the Chief Registrar of Friendly Societies, 28 Abingdon street, Westminster, S.W. The secretary of the Agricultural Organisation Society, Dacre House, Dacre street, Westminster, S.W., will also supply model rules on application, and is willing to conduct the necessary proceedings as to registration.



## WINTER ASPARAGUS.

The market gardeners who supply Covent Garden Market, in London, with several kinds of vegetables during the severest winters, which said vegetables, in the ordinary course of nature, are produced in the spring and summer, make a very good thing out of raising asparagus in the winter.

Growing winter asparagus is quite simple, to all appearances, though there are probably subtleties about it which, unless governed by experience, lead to disaster. The "crowns" are produced in the ordinary way, and reach maturity in three years. When they are removed to the forcing bed, they are covered with fine soil to a depth of 5 or 6 in. There they live for a month in what is practically a vapour bath. The bed rests on a brick foundation, with spaces between the bricks. Underneath is a tunnel through which run iron pipes conveying a stream of hot water. They heat the water contained in an earthenware gully, so that steam is constantly produced. The bed is covered with glass frames, which serve the double purpose of confining the heat and attracting all the available sunlight; for without sunlight asparagus would not be—asparagus. The most curious difference between the forced and the natural variety is in the method of gathering it. Seasonable asparagus is cut with a knife which is as much like a fork as a knife, and the operation is a very delicate one. An unskilful cutter, by wounding the "crown" of the plant, may do an enormous amount of damage. The sticks of forced asparagus are "pulled"; just broken off by a twist of the fingers, which are easily plunged into the fine soil with which the crowns are covered. As the asparagus matures all at once, it scarcely matters whether the crown is injured by this violent method of collecting its fruit. And the crown, once forced, is thrown on the manure heap. Four crops can be grown in the same bed during the short winter season. The average price which the asparagus fetches at Covent Garden is 6s. per bundle of 100 sticks. The price, of course, varies considerably, and is always higher when Parliament is sitting and the "season" is in full swing. So it may be imagined that the winter asparagus grower takes an interest in politics, and contemplates an autumn session and the consequent later meeting of Parliament in the New Year with some misgivings.

One of the principal market gardeners in Essex is Mr. Poupart, a descendant of one of the French *émigrés* who settled in England after the Revolution. Besides asparagus, Mr. Poupart also grows a great deal of seakale, which is easy to force. It grows in complete darkness, the plants being covered during their development with what are known as Archangel mats. Curiously enough, another variety of artificially-produced vegetable, though ordinarily flourishing in sunlight, requires no light and no great amount of heat for its winter growth. You may have noticed the delicate tints of early rhubarb—the brilliant crimson of the stem and the tender yellow of the foliage. A perfectly dark barn, with a temperature of 60 deg. or so, is all the equipment necessary. Light spoils it, and if there is a crack in the roof a tinge of pronounced green and a dirty red is the result.

A rather interesting fact in connection with this Essex farm is that all its produce is conveyed to London by road and by the power of the stalwart shire horse. The distance is 16 miles, and the round trip occupies 36 hours, allowing, of course, for the necessary wait in Covent Garden Market for unloading, and so on. The railway or the motor has not yet triumphed over the means of transit which satisfied Mr. Poupart's grandfather 100 years ago. There is one point about this slower road-travelling; there is less risk of injury to the produce.

As regards growing seakale in darkness, Mr. Charles Ross, Manager at the Westbrook State Farm, is an adept in the art, and has frequently had very fine exhibits of this and similarly produced vegetables at the various exhibitions and shows in Brisbane and elsewhere.



## Dairying.

### THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

#### RECORD OF COWS FOR MONTH OF MARCH, 1909.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	College Lass	Ayrshire ...	31 Jan., 1909	1,227	3.7	50.50	
2	Glen ...	Grade Shorthorn	29 Jan. "	953	4.6	49.20	
3	Nellie II. ...	Shorthorn ...	25 Feb. "	1,159	3.3	42.25	
4	Butter ...	" ...	20 Feb. "	1,017	3.5	39.47	
5	Blackbird ...	Grade Holstein ..	4 Feb. "	889	3.8	37.64	
6	Lady Ring	Guernsey ...	26 Jan. "	641	5.2	37.30	
7	Poppy ...	Grade Guernsey	10 Jan. "	669	3.5	37.30	
8	Laura ...	Ayrshire ...	16 Nov., 1908	839	3.6	33.56	
9	No. 112 ...	Grade Shorthorn	12 Nov. "	706	4.2	33.22	
10	Whitefoot ...	Holstein-Devon	20 Oct. "	871	3.3	31.75	
11	Rosalie ...	Ayrshire ...	10 Feb., 1909	963	3.0	31.70	
12	Maud II. ...	Shorthorn ...	16 Jan. "	669	4.2	31.47	
13	Bangle ...	" ...	23 Feb. "	786	3.6	31.44	
14	Conceit ...	Ayrshire ...	22 Dec., 1908	810	3.3	29.53	
15	Comet ...	Holstein ...	22 Nov. "	723	3.7	29.76	
16	Gem ...	Grade Shorthorn	2 Nov. "	621	4.2	29.24	
17	Careless ...	Jersey ...	7 Dec. "	674	3.7	27.74	
18	Dot ...	Shorthorn ...	12 Nov. "	749	3.3	27.29	
19	Peewee ...	Grade Holstein ..	20 May "	626	3.9	27.06	
20	Ethel ...	Holstein ..	3 Sept. "	645	3.7	26.54	First calf
21	Remit ...	" ...	5 Aug. "	623	3.8	26.37	
22	Nancy ...	Grade Shorthorn	7 May "	524	4.4	25.87	
23	Len ...	Ayrshire ...	6 May "	627	3.7	25.80	
24	Daisy ...	Holstein ...	24 Oct. "	813	2.8	25.44	
25	Cocoa ...	Jersey ...	20 Nov. "	539	4.2	25.35	
26	Dora ...	Shorthorn ...	18 Nov. "	711	3.1	24.25	
27	Lalla ...	Holstein ...	28 July "	525	4.0	23.46	First calf
28	Dewdrop ...	" ...	11 Nov. "	742	2.8	23.22	
29	Eve ...	Jersey ...	16 Oct. "	500	4.0	22.35	
30	Lowla ...	Ayrshire ...	8 Dec. "	608	3.8	22.17	
31	Lady Loch	" ...	24 June "	384	5.0	21.67	
32	Duchess	Shorthorn ...	3 Mar. "	523	3.7	21.52	First calf
	Fanny						
33	Nita ...	" ...	23 Nov. "	517	3.7	21.27	
34	Orange ...	Grade Guernsey	23 Oct. "	365	5.2	21.24	
35	Burton's	Shorthorn ...	7 Sept. "	426	4.4	21.03	First calf
	Fancy						

Natural pasture only.

#### SPECIFICATIONS FOR ERECTION OF PIGGERIES.

*Site.*—Select a suitable and convenient position with an aspect to protect from cold winds and excessive sun's rays.

*Drainage.*—Take ground levels and adjust building to insure rapid discharge of liquids from concrete floors direct into concrete drain. Where necessary, the ground should be brought to an even grade, and if in the case of a sharp slope the building is erected to follow it, a shallow drain in the concrete floor should be provided on the lower side of each individual pen, to discharge into the main drain.

*Material.*—Where bush timber is not available, use sawn, in suitably matched sizes; this latter timber admits of better hygienic conditions.

Galvanised iron, protected by a cooling paint, is preferable to a bark or thatched roof.

*Concrete Footing.*—Cut out trench and fix boards to complete a mould to form a footing for ground plates 18 in. deep by 8 in. in width, with a bevelled edge at the outside to carry off the drip from walls. Set in a few bolts at intervals to secure ground plates in position. A similar footing, with the necessary dip to give drainage, may be used between pens to carry plates; but where the timber can be checked in flush and bolted to the uprights forming the front of building, the footing may be dispensed with, and the same purpose secured when the concrete flooring is put in.

*Frame.*—Halve at ends and fix ground plates, morticing for uprights and studs on back wall; cut to suitable tenons for top and ground plates. Frame for sliding door, using a bevelled top sill as shown on plan. All uprights for front of building and posts forming the small pens should be based on a 6-in. layer of concrete, and set in the same material, when fixed in correct position.

Check out for front top-plate, bolt, fitting raking plates to securely tie the building.

*Rafters.*—Check for plates and securely spike, allowing for suitable overhang.

*Iron.*—Secure with not less than one and a-half corrugations by means of lead-head nails.

Use 16 in. ridge-capping, as shown at apex of roof. Attach fascias and fix 24-gauge O.G. guttering with brackets, giving the necessary fall.

*Slabs.*—Trim to an even thickness at ends, and secure with cleats, firmly spiked to plates.

*Sliding Doors.*—Fit as detailed on plan with hasp and staple to each.

*Kerb.*—Scarf out uprights in front of covered pens and bolt in wooden kerb for concrete. A similar protection should be made to the main drain running along front of pens. In the latter case bolt the kerb to stout supports sunk in the ground, which may be strengthened by being set in concrete.

*Yard.*—Uprights should be placed on a 6-in. layer of concrete, and firmly set in the same material.

Horizontal rails or battens may be secured by means of cleats and nailed, but cap rail should be cut to a stout tenon and firmly bolted to uprights at each end. Stiffeners should be put in centrally on each side of the division rails and nailed.

*Troughs.*—Use hardwood  $1\frac{1}{4}$  in. in thickness. Fit tongues made on the side pieces into grooves cut in bottom board of each. Use solid ends, ploughed out to receive sides. Screw together with caulked joints. Bolt the whole firmly together at top and bottom to prevent spreading.

*Pivots* of  $\frac{7}{8}$  in. round iron should be stumped on to  $\frac{3}{8}$  in. flat iron plates bored for 4 holes. Countersink plates and attach to each end of trough, using  $\frac{3}{8}$  in. cup-headed bolts for the purpose. Troughs may thus be tilted and flushed out easily.

*Swinging Door.*—The cap rail for hinging door to, is to act as a brace for uprights at each end of it, and a packing piece should be attached to the uprights to follow the same travel as the door. The door may be held in alternative positions by means of a sliding batten or barrel bolt.

Use hook-and-band type of hinge.

*Floor.*—The floor should be laid with concrete 6 in. in thickness, compounded as described below, with a fall of not less than 2 in. in 8 ft. The concrete at front of covered pens should have an 8 in. by 2 in. hardwood kerb securely fastened to uprights. Arrange for a drop of  $2\frac{1}{2}$  in. to 3 in. out of the covered into the open pens. The concrete in the latter should slope as previously mentioned to a point immediately under trough, from which it should dip sharply into the main surface drain; this latter to be properly kerbed, as



shown, and be laid in sections of 8 ft., with a clean joint between sections. The covered-in sleeping pens should be provided with a flooring of wood, made "removable" to rest on the concrete.

The most suitable compound to form concrete will depend upon the class of material available. Apart from the usual practice, a good floor may be made as follows:—

*Grouted Rubble Concrete.*—Pack the floors to a depth of 6 in. with suitable stone of 4 in. or 5 in. gauge. Ram to an even surface, and gauge fall with a straight edge. Damp the stone before grouting. Take 5 parts of coarse, clean sand to 2 parts Portland cement; mix thoroughly when dry, and sieve well. Then mix with water and bring to the consistency of thick cream, and brush the grout well into all joints and interstices.

*Preparation of concrete according to specifications and description compiled by Mr. Arthur Morry, for construction of cattle dips.*

The strength of concrete varies considerably, according to the quantity and the quality of the cementitious material used, also according to the nature of the aggregate employed. A coarse, clean sand and broken metal with sharp edges and irregular surfaces give a material of greater strength than that produced by fine sand and rounded water-worn pebbles, because a better surface is offered for the interlocking of the crystal formation.

Concrete diminishes in bulk from 20 to 30 per cent. when the materials composing it are mixed together, well wetted, and finally well rammed in position, so that 1 cubic yard of finished concrete composed of 6 parts of aggregate to 1 part of cement requires 1 cask or 3 bags of cement and about 31 ft. cube of gravel or other material.

The quality and proportion of the sand used are important factors in producing good work; it should not be too fine in grain or the particles to be united together become too numerous for the quantity of cementitious material employed; it should be free from muddy or clayey particles, as these deleteriously affect the formation of crystalline silicates of lime and alumina, without which the proper setting or hardening of Portland cement concrete cannot take place. The sand should also be in just sufficient quantity to fill up the interstices of the metal or gravel, and produce a compact mass when the whole is bound together.

A broken metal or other aggregate which is slightly porous produces a stronger concrete than river pebbles which are almost impervious; for this reason of old broken bricks, if hard, are excellent material to use.

A simple plan for testing the proper quantity of sand to be used is the following:—

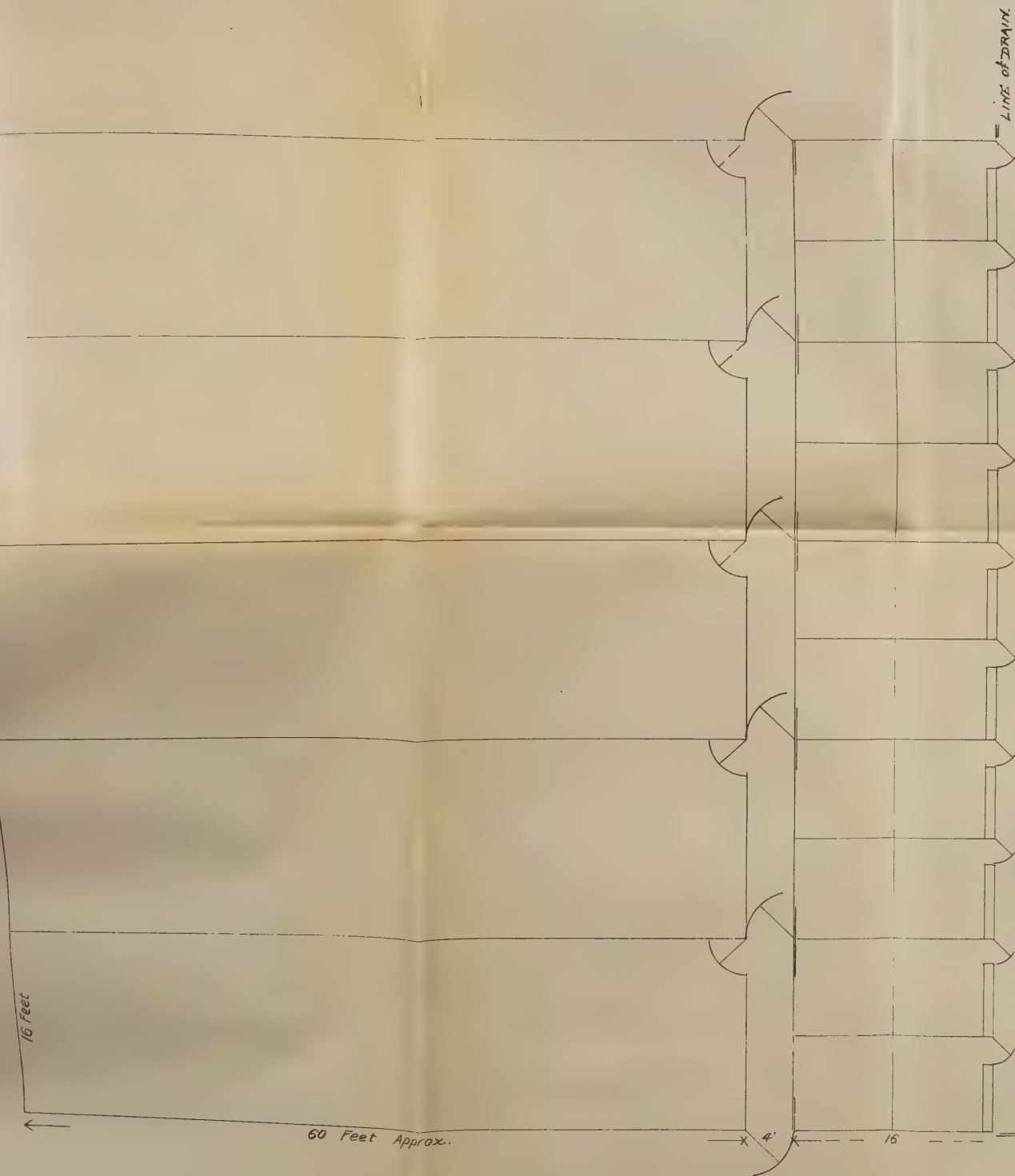
Provide a box containing, say, 1 cubic foot (or a kerosene tin will answer the purpose), and fill it with broken metal or gravel; after sifting out all the sand through a fine sieve, fill it with water, and allow to stand until the stones have become thoroughly saturated and will absorb no more, pour off the remaining water, then take another similar vessel, fill it with water, and pour into the first until the spaces between the stones are filled and the water runs over the top; now measure the quantity which has been used out of the second vessel, add to it 20 per cent., and this will give the quantity of sand necessary to produce a first-class concrete.

If pit sand is used, it should be washed to get rid of the clayey matter; it can be tested by stirring in a glass with water, when the clay will be deposited on top when settlement takes place.

*Cement.*—Only the best Portland cements should be used for cattle dips; usually any of the cements offered in the Queensland markets is suitable for the purpose, but occasionally a damaged shipment is offered at a low price, from which good results cannot be obtained. Work executed with materials of

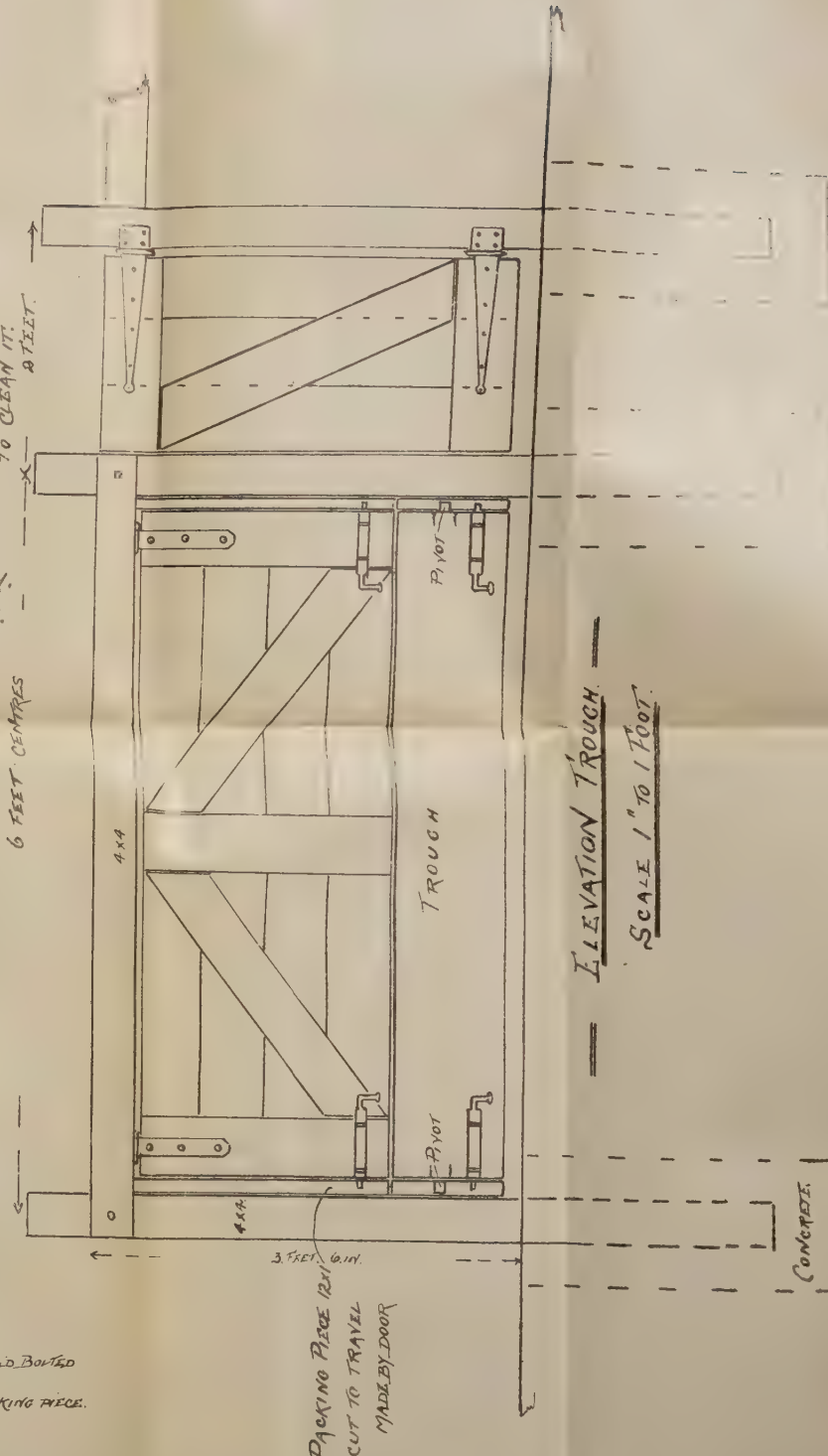
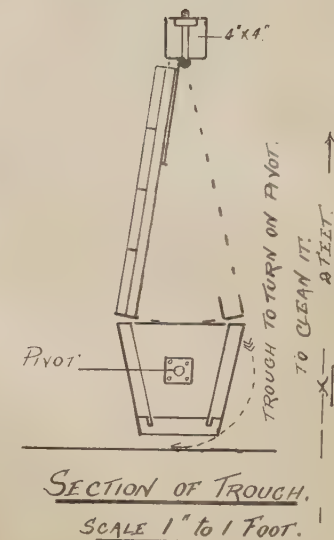
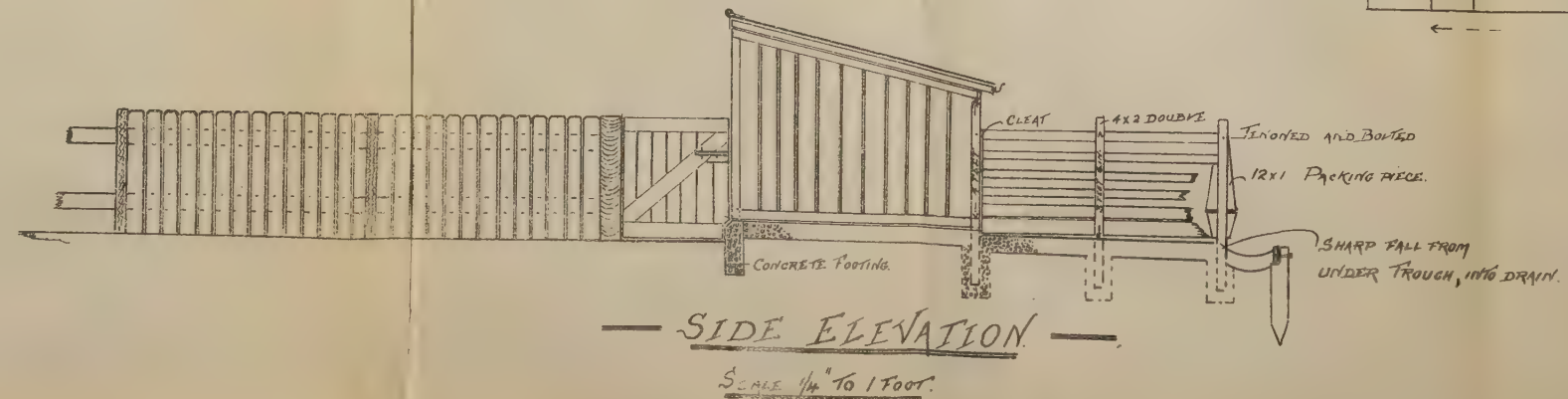
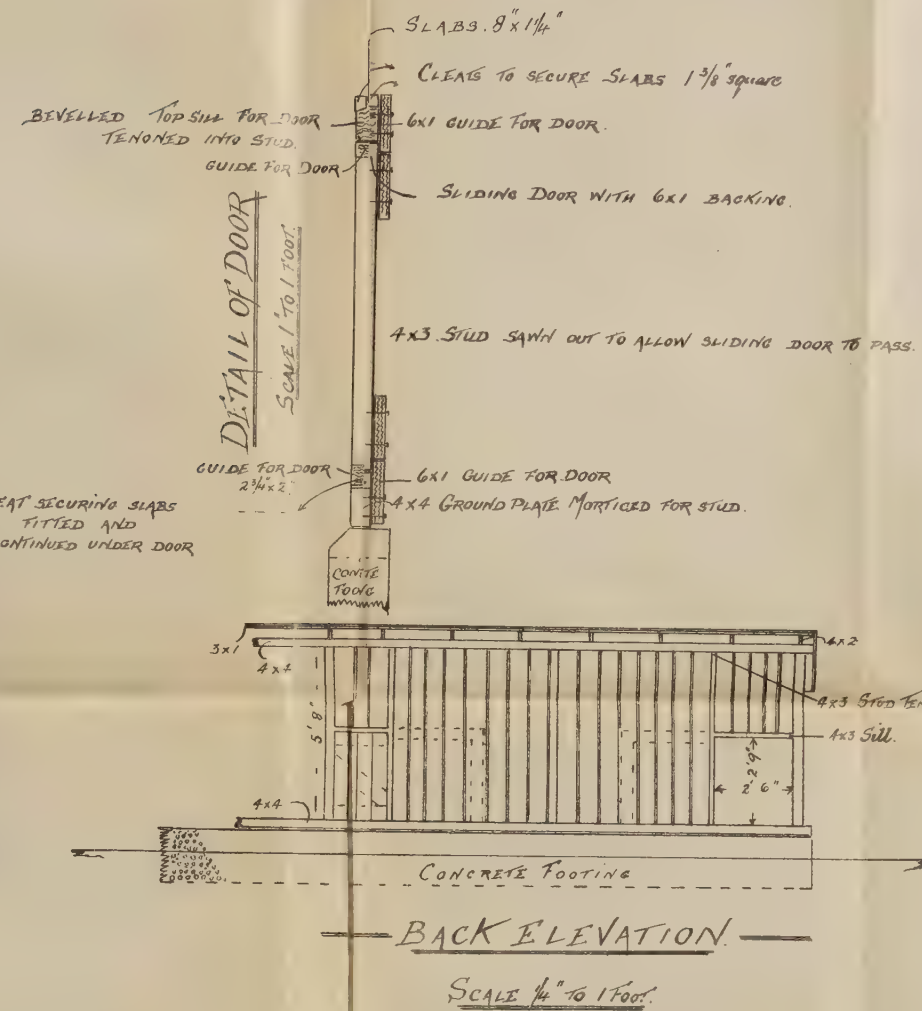


# PLAN OF PIGGERIES.



GROUND PLAN.

SCALE 1/8" TO 1 FOOT.



PACKING PIECE 12x1 CUT TO TRAVEL MADE BY DOOR





this class in cattle dips is invariably a complete failure. Some cements set much more slowly than others; these should not be rejected on that account, as their ultimate hardness will often exceed that which sets more quickly.

Water used for making concrete should be clean and fresh, and, if possible, free from organic matter and lime in solution. From 21 to 24 gallons is required for every cubic yard of dry materials.

Provide a gauge-box of 1-in. pine, 3 ft. by 3 ft. by 1 ft. 2 in., strongly nailed and clamped together; this will gauge about 1 cubic yard of finished concrete when filled three times.

The concrete should be composed of 1 cask or 3 bags of best Portland cement to 3 gauge-boxes, or 31 ft. 6 in. cube of aggregate, which should consist of clean river gravel passed through a  $1\frac{1}{2}$ -in. mesh sieve, and the surplus sand removed as previously described; or of  $1\frac{1}{2}$ -in. broken metal and a sufficient quantity of clean coarse sand to fill in the interstices. It should be turned over twice dry and twice wet, thoroughly well mixed, then wheeled or thrown into position, packed with a shovel to the proper level, and thoroughly well rammed until the water appears on the surface. Care must be taken not to use too much water or the strength will be reduced, but sufficient should be used to work up the cement to the surface on well ramming.

It is most important that the mixing is thorough, because it is in imperfectly mixed concrete that cracks and flaws appear. The best way is to mix the sand and cement together thoroughly in a dry state, then place the stones on the top, mix well together dry, then add the water through the rose of a watering-can and proceed as usual.

---

### THE SPIDER PEA.

Mr. D. O'Connor, Oxley, writing on the subject of the Spider Pea, gives a very interesting account of its introduction in the early sixties into Victoria from India by a Victorian squatter. He was fortunate enough to obtain a few of the seeds, and found they produced an excellent crop of delicious peas. On settling in Brisbane, in 1876, Mr. O'Connor found that this pea was unknown in Queensland and in the Southern States amongst the seedsmen.

At last the "Australasian" published a letter from Mr. O'Connor, stating his want of success in obtaining the seed. That journal said:—"He (Mr. O'Connor) describes it as the most delicious pea he ever tasted, easily cultivated, requiring no sticks; stood dry weather well, and retained its tenderness longer than any other kind. It was called the 'Spider' because of its habit of growth, stooling out in all directions, therefore rendering it necessary to sow the seeds 36 by 18 in. apart."

The editor added:—"Forty years ago the spider pea could be bought in Melbourne at 2s. 6d. per lb., but from some unexplainable cause it is not to be seen in any Victorian seedsman's catalogue of the present day."

After the publication of Mr. O'Connor's letter in the "Australasian," he received several letters from gentlemen who had once grown the pea in question; but they were no longer in possession of any.

Finally, a letter was received, accompanied by a few seeds of the long-sought pea. "These," says Mr. O'Connor, "though late in the season, were at once sown; I was delighted when I saw the stems spreading out in all directions; I counted seventeen from one root. This was unusual, the average is about ten or twelve."

Seeds are not available at present, but I hope will be next season, when they will be distributed by a Brisbane seedsman, of which due notice will be given.



## The Horse.

### CARE OF HORSES.

Good farm horses cost money, and no one can afford to injure any expensive chattel. Horses are the farmer's willing slaves, and if they are treated kindly, fed well and judiciously, not over-worked, their strength not unduly taxed, there is nothing in reason they will not willingly do. Why beat and starve a horse? Why work him until he is ready to drop with heat and thirst? Why leave him standing alongside the plough in the blazing sun, or bleak, cutting wind, whilst you or your man go to the house for dinner and an hour's comfortable rest? Of all cruelties to a horse, one of the most inhuman is to work the animal from early morning till noon without being allowed a spell or a drink unless the ploughman wants a spell himself. The horses may or may not have had a drink before going to work, yet at noon they get a feed of dry lucerne hay and a little corn; then, mad with thirst, they are taken to a creek or waterhole, and are allowed to drink all they can, with no thought of the possible bad effect of the cold water on an overheated system.

Horses require water at frequent intervals. To let an animal drink at 7 a.m., and then work it till noon without any refreshment, is cruelty. If those in charge of horses would only pause and think of the effect of a drink on themselves, perhaps they would have more consideration for the patient horses. The man feels thirsty after following the harrow in the dust for an hour, and he quenches his thirst from the water-bag. It is not long, however, before he again feels he must have a refresher. Why can he not consider that the same causes produce the same effect on his horses? There would be little time lost if they were allowed a drink every two hours, and they would work all the better for it.

It has been found that a horse drinks less water in a given time if he has continual access to it in the stable than when watered at long intervals. A horse should always be allowed to quench his thirst on coming from work, even if he is hot. A very general opinion exists that it is injurious to water horses when in such a state of heat, and they are therefore, in many instances, not watered until they have somewhat cooled down; this opinion is wrong, as it does not hurt horses to drink cold water directly they return from work. It is, however, hurtful to let a horse drink after he is partly cooled down, and this practice is very liable to cause a chill to the system. It may often be noticed that horses that have come in hot, and are not watered directly, but some time afterwards commence to shiver after drinking a bucketful of water, whereas, if a horse is allowed to drink before the blood has cooled down, he will not do so. The explanation of this, no doubt, is as follows:—Cold water, on entering the body, absorbs a certain amount of heat from the system, in order to bring its temperature up to the internal temperature of the animal drinking it. In the case of a horse in a hot state, the loss of heat is not felt, as there is sufficient heat to spare, whereas, in a horse which has already partly cooled down, and whose system has begun to flag, the sudden further loss of heat occasioned by the cold water entering the body, and absorbing heat causes the system to become chilled.

Now, as to feeding horses. The animal's constitution must be studied. One horse will have a good appetite, eat up all his dinner, and be ready for the afternoon's work in a reasonable time, whilst a horse with a poor appetite will take more time, and pick out the best parts. This is no fault of the

horse. He wants some appetising medicine. Give him something less in quantity but better in quality—a little bran or pollard, for instance. This will enable the weaker horse to keep up to his work. Old horses must have more attention than young ones in the matter of food. It is unreasonable to expect old horses to do the same amount of work as younger ones on the same kind and amount of food. Remember that horses have small stomachs, so they should not be fed too much at one time. If you allow a horse to gorge himself, he will get indigestion.

Hay should not be fed in the middle of the day. The heaviest feed should be given at night, when the animals will have plenty of time to digest it. Some horses require more hay or chaff than others. The amount of food a horse requires varies with the speed at which he is worked. Suppose a horse to walk  $12\frac{1}{2}$  miles, he will do the distance comfortably on  $19\frac{1}{2}$  lb. of hay, but if you trot him over the same distance, even 24 lb. of hay is insufficient. Scientific men have shown that a horse weighing 1,000 lb., and doing only moderate work, requires but  $11\frac{1}{2}$  lb. of digestible food daily; but, with average work, he requires  $13\frac{1}{2}$  lb.; and, when heavy work is being performed,  $16\frac{1}{2}$  lb. If, in each case, the animal gets 10 lb. of hay, he would require, in addition,  $11\frac{1}{2}$  lb. in an equal mixture of maize and oats in the first instance, 15 lb. in the second, and 20 lb. in the third. No draught horse should be allowed more than 12 lb. of hay or chaff in a day. Farm working horses, in good seasons, consume too much of this coarse fodder. If the hard-working horse were fed on hay alone, he would require 40 lb., but such a supply would be fatal to good results, and absurd to supply.

An excellent feed for a horse doing moderate work—a horse weighing 1,000 lb.—is a mixture of 10 lb. of hay with  $11\frac{1}{2}$  lb. of oats, or with  $10\frac{1}{2}$  lb. of maize and oats in equal parts, or 8 lb. of oats and 4 lb. of bran. Barley may be substituted for oats.

Finally, never leave your horses, after they return in the evening to the stable, without giving them a good rubbing down. An old saying is, that a good rub down with brush and curry-comb is as good as half a feed. Clean them from nose to tail, and dry them off with a cloth. Look to any sores they may have, and apply liniment or ointment to them. In raw, cold weather, when your horses have to stand for any time in the wet, cover their loins with a cloth. It will prevent the risk of their catching cold. Treat your horse, in fact, as you would treat yourself. Feed him well, treat him kindly, don't overwork him, give him comfortable quarters, and you will not often require the services of a veterinary surgeon. It is well for all horse-owners to study some book on veterinary science, in order, at least, to be able to recognise the more apparent ailments of the animal, and those which will yield to the very simplest treatment. In any case of difficulty or doubt, consult a surgeon as early as possible.

---

#### “THE AUSTRALIAN SUGAR JOURNAL.”

We are in receipt of the first monthly number of Vol. I. of the newly-launched “Australian Sugar Journal.” On the principle that “good wine needs no bush,” this first issue needs no criticism—beyond this, that the matter is well chosen, the subjects of deepest interest to sugar-growers and workers dependent on the industry are well and temperately discussed, whilst the illustrations are clear and instructive. The journal should prove of great value to all interested, directly or indirectly, in the, at present, greatest of Queensland's industries. The subscription, including postage, is 5s. per annum, and, as a correspondent of the “Journal” says: “No one, surely, can aver that the charge is unreasonable.”



## Poultry.

### TO FATTEN YOUNG FOWLS.

The quickest way to fatten fowls for the table (says "Garden and Field") is to put them into special coops and feed them with meal. Premising that they be young—say, 16 to 18, or even 20 weeks' old—and fleshy, two weeks' confinement ought to make them very good. The birds must have room in the coop to stand up and shift their positions, but not to move about. They should be fed three times regularly each day, and their food should be soft meal, as it is almost impossible to get fowls in proper form on hard corn. Pollard, barley meal, Indian meal, or rolled and ground oats, mixed with a little rice flour and skim milk, and occasionally dripping or suet, is good food. The feeding troughs, which must be kept constantly scoured, should be placed before the birds at regular intervals, the first being directly at daybreak; and when they have eaten sufficient it is best to remove the troughs, placing a little gravel within reach of the fowls to assist digestion. The food should be freshly mixed each day, and no more given than will be eaten clean at each meal.

Keeping the fowls without food for some hours after they are put up frequently induces them to take it more readily afterwards; but sufficient attention is rarely bestowed on the various details of preparing and supplying food, hence complaints of the fowls deteriorating in the fattening pen are far from uncommon. A coop 3 ft. high, 2 ft. wide, and 4 ft. long will admit from six to eight fowls; the bottom and front should be of bars 3 in. apart; a board outside, in front, 3 in. wide, will serve as a stand for the food trough. The coop should be kept dark between the times of feeding, by hanging old sacks over the front during the day. Sleep and warmth promote fattening; but stale food, irregular times, coops in draughts and places not protected from cold, and the sight of fowls at liberty, do not. The coops should be about  $3\frac{1}{2}$  ft. from the floor, and underneath strew ashes or dry earth, mixed with powdered lime, so that the droppings of the fowls may be easily removed. Perhaps the best class of fowls for fattening purposes is a heavy docile sort, or crosses of these breeds with each other or with an Indian game cock.

---

### DO HENS GET TOO FAT TO LAY?

Many poultry owners hold the belief that hens, to lay properly, should not be too fat. On this point, Professor James E. Rice, a well-known poultry expert at the New York Experiment Station, says:—

"Last fall we killed a large number of hens, and found that the fattest hens were those in the best laying condition, and since that time we have been making careful observations on that point. A hen to be in good laying condition must have fat in her body. The production of eggs is based upon one of the experiments, and we found the fact that the hen has lots of stored-up energy in her condition; and a hen cannot lay an egg until she has got fat in her body, because the yolk in an egg is about half fat, and she has got to have oil there to make the best part of the egg. The fattest hens we killed were in the best laying condition, and the poorest hens we turned out by themselves, and there was not the faintest chance of their laying for two or three months."

There is no doubt but that the laying of eggs requires a great deal of “stored-up” energy in the hen, and it is naturally to be presumed that a hen in good condition would be more able to stand a drain on her system than a poor bird. The matter of fat in hens we believe is a great deal like high condition in breeding stock of any kind.

Poor breeding or poor egg production is not caused so much by high condition as by the manner in which this state was brought about, and the subsequent care given the animal. A good plump form, resulting from proper feeding of proper foods, followed by proper care, will not be conducive to bad results in the pen. A hen needs lots of nourishing food if she will continue to lay eggs; a starved hen will not fill the egg case very soon. Too much fat, however, and too little exercise, is a cause of hens not laying. But there need be little fear of a hen becoming too fat if she is healthy, and has the proper amount of exercise. Herein lies the reason for feeding grain amongst a straw litter in the winter time. Do not feed a single grain, and that one extremely rich in fat-producing elements, but feed a mixture, the more kinds the better, and feed it in a good litter so that the hens will have to hunt for it. High condition caused in this way will not be the cause of non-egg production.

Statistics.

COMMONWEALTH METEOROLOGY.  
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1908.										1909.		
	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
<i>North.</i>													
Bowen ... ..	9.46	3.73	0.99	0.45	0.88	0.51	0.96	2.47	0.42	0.42	15.48	4.52	1.06
Cairns ... ..	20.60	5.99	3.05	0.59	3.70	2.12	0.74	3.07	1.60	1.41	32.05	5.25	21.03
Geraldton ... ..	34.00	14.23	18.52	2.64	8.11	3.66	2.81	6.93	3.89	1.69	47.92	10.29	37.31
Gindie State Farm ... ..	6.25	0.02	0.112	...	0.40	1.27	...	...	...	...	...	...	...
Herberton ... ..	8.92	1.40	0.38	0.31	2.36	Nil	0.51	1.27	0.61	0.78	12.41	2.28	3.52
Hughenden ... ..	6.91	0.30	Nil	0.05	0.68	Nil	Nil	1.67	1.94	1.05	7.55	1.55	2.86
Kamerunga State Nurs. ... ..	25.75	4.60	3.363	0.76	4.85	1.53	...	3.64	1.69	...	...	3.52	...
Mackay ... ..	17.43	14.82	3.25	1.29	1.65	0.71	2.27	1.80	2.57	0.02	15.00	1.36	9.00
Rockhampton ... ..	9.77	2.62	0.85	0.10	1.08	0.84	0.20	2.14	2.47	1.37	9.01	2.01	1.68
Townsville ... ..	9.03	0.38	2.22	Nil	1.70	0.27	0.28	1.58	1.26	0.07	6.94	1.70	7.01
<i>South.</i>													
Biggenden State Farm ... ..	9.84	2.97	0.74	0.43	0.49	2.33	1.39	1.89	2.12	3.66	7.37	2.68	2.45
Brisbane ... ..	18.19	2.45	2.40	0.17	0.77	2.83	0.67	1.77	2.25	1.28	1.99	2.72	2.65
Bundaberg ... ..	7.35	4.13	0.67	0.39	0.75	1.56	1.10	2.39	0.73	3.34	6.52	3.70	5.06
Dalby ... ..	7.61	0.11	0.37	0.63	0.14	1.89	1.13	2.55	3.65	1.56	1.46	3.55	0.99
Esk ... ..	17.04	2.83	1.07	0.23	0.46	2.75	2.16	1.29	5.99	3.62	2.64	3.21	3.27
Gatton Agric. College ... ..	10.74	...	0.10	0.16	0.6	2.71	1.84	1.93	5.71	1.29	1.94	5.00	3.18
Gympie ... ..	8.08	1.87	2.00	0.38	1.16	2.87	1.37	2.49	2.58	3.97	3.86	3.77	3.41
Ipswich ... ..	13.77	2.71	1.14	0.12	0.47	3.23	1.19	1.48	5.09	1.05	1.37	1.95	2.66
Maryborough ... ..	11.40	2.52	1.05	0.46	0.81	1.98	1.05	1.84	1.92	1.64	8.36	7.11	2.28
Roma ... ..	2.51	0.22	Nil	0.55	0.63	1.38	1.12	2.15	2.79	1.68	5.19	4.85	4.18
Roma State Farm ... ..	...	...	...	...	1.27	0.73	...	...	...	...	...	...	...
Tewantin ... ..	14.39	7.59	8.66	0.75	1.97	2.70	2.18	2.39	7.50	4.12	6.44	3.31	4.34
Warwick ... ..	6.65	1.40	0.15	0.80	1.24	2.99	1.96	0.96	5.28	2.02	0.87	0.82	1.30
Westbrook State Farm ... ..	1.41	1.40	00.5	...	0.49	1.97	...	...	2.05	...	...	2.61	1.43
Yandina ... ..	16.62	5.45	4.59	0.58	2.64	2.18	1.50	3.10	6.03	2.75	6.69	6.42	3.71

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,  
Divisional Officer.



## The Orchard.

### HOW TO PULP FRUIT.

The principle under which fruit is preserved in the form of what is termed "pulp" is the same as that of canning or bottling. The process, however, varies slightly to meet the requirements of a separate branch of trade.

Canned fruit is preserved in such a form as to be available for use for every table.

Fruit-pulp supplies a demand among jam manufacturers and confectioners for fruits, large and small, in a more concentrated form than the canned article at seasons of the year when they are not to be procured fresh. The demand for fruit-pulp in the Home markets has hitherto been met mainly from the south of Europe. To compete successfully in an established market it will be essentially necessary to adopt the size of tin, and style of package, which has already found favour with the buyers.

### SIZE OF TINS AND STUDS FOR LARGE FRUITS.

Round tins are used, 10 in. deep,  $5\frac{3}{4}$  in. to 6 in. in diameter, to hold 10 lb. of fruit when filled. Studs of tins should be 3 in. to  $3\frac{1}{8}$  in. wide. A large stud is needful to avoid as much as possible crushing the fruit in filling the tins. The package will contain ten tins to the case.

### PROCESS FOR LARGE FRUITS.

Large stone fruits, such as apricots, are halved, and the stones removed. Apples and pears will be halved or quartered, peeled, and cored (these for home or colonial requirements). The tins are filled with fruit, tightly packed, to which little or no water is added (in this the process differs from that of canning), placed in a shallow boiler, the water in the boiler brought up to and kept at boiling point until the whole of the contents of the tins has reached that degree of heat. It will then be found that the fruit has settled considerably, necessitating the refilling of each tin with the cooked fruit. The tins having been refilled, the studs are soldered on with the vent holes open, again placed in the boiler, and the contents a second time brought up to boiling point. The vent holes are then stopped, and the tins cooled as quickly as possible. The cooling will be hastened by leaving spaces between the rows of tins and placing battens between the different layers.

### SIZE OF TINS AND STUDS FOR SMALL FRUITS.

Tins of 4-gallon capacity, similar to those used for kerosene, but of heavier material, are used, with studs 2 in. in diameter.

### PROCESS FOR SMALL FRUITS.

Small fruits, such as raspberries, are preserved in quantity, the fruit in this case being cooked for one hour in the steam-jacket pans used in jam factories, or, where the preserving is done at or near the orchard, in an ordinary copper boiler: constant stirring being necessary to prevent scorching, which would affect the flavour and marketable value of the finished article. The cooked fruit should be rapidly ladled from the boiler into the tins, a large-sized funnel being used to expedite the work, in order that there may be no unnecessary delay, with consequent loss of heat, before the stud is soldered on and the vent hole closed.

## THEORY OF THE PROCESS.

The necessity for exercising care in each step of the process will, perhaps, be better understood when the theory is fully comprehended. All fruits having attained a certain degree of ripeness ferment more or less readily. In the preparation of fruit pulp, as in canning, a sufficient degree of heat is employed to destroy all germs of fermentation. While that degree of heat (in no instance should it be allowed to fall below 180 deg. Fahr.) is still maintained the tins are soldered, so that the atmospheric air is entirely excluded, and with the air the germs of fermentation. It will be evident that there must be no time lost before hermetically sealing the tins when once the fruit has been removed from the fire-heat.

## NECESSITY FOR CAREFUL TESTING OF TINS.

It is essential that each tin should be carefully tested before being finally packed. For this reason, it is advisable to defer packing for shipment for ten days or a fortnight after preparation. During this period, if the conditions are favourable, as is usually the case during the fruit season, fermentation in the defective tins will have commenced. Tins that have been hermetically sealed, on cooling, show contraction. The reason of this is that the contents expand under the heat employed, and again contract on cooling, leaving a vacuum which the atmospheric air endeavours to fill, compressing the tins in its efforts to do so. Those that have a hole, however small, will keep their usual shape, the air entering as the contents of the tins contract in cooling. When fermentation has commenced this will frequently bulge out, owing to the expansion of the contents, caused by the gas formed in fermentation. To make quite sure tins may be plunged upside down in boiling water, when the expansion under heat will cause bubbles to rise from each defective tin, and the weak spot on each can be marked and resoldered. Fruit in defective tins will require to be treated a second time, as at first, but if fermentation has commenced the flavour will have so deteriorated that it should not be graded first class, the current market value being lessened in proportion to the loss of quality, probably one-half.—“Farm.”

## TRAPPING MOTHS.

The Journal of the Jamaica Agricultural Society takes the following from “Chambers’s Journal” for December:—

In order to mitigate the pest of caterpillars which is wreaking such havoc in defoliating the forests of Germany, a novel expedient has been adopted. The irresistible fascination of the candle-flame to the moth is well known, and entomologists are aware that street electric arc lamps afford a happy hunting ground. The German authorities have turned this point to advantage. An electric light is erected on a suitable tower, beneath which is a deep, funnel-like vessel carrying powerful exhaust fans. These electric lights are fitted with powerful reflectors, which project the light in two well-defined rays upon the dark background of the forest, half a mile away, in much the same way as the beams of a searchlight. The result is described as remarkable. The hordes of brown moths that lay the eggs producing the caterpillars in such enormous quantities, dazzled by the light, come fluttering hastily towards its source. As they near the lamp they become caught in the vortex set up by the revolving fans, are sucked up, and swept through the funnel into a suitable receiver, subsequently being destroyed in the furnaces. So eminently successful was the first night’s experiment, when some 3 tons of moths were caught, that another similar installation is being erected. Though the defoliation of the trees may not be completely arrested, this wholesale destruction of the plague will certainly result in a heavy diminution in the ranks of the caterpillars, and the timber will be saved.



# Horticulture

## FLOWER GARDENING, No. 16.

### PLANTS SUITABLE FOR IN AND OUT DOOR CULTURE.

By THE EDITOR.

#### ORNAMENTAL GRASSES.

"A garden, from the beginning of time, and with all peoples, has been a refreshment to the spirit, and a repose to the flesh: a delight in the spring of life and of the year; a refuge in the autumn from the winds that sweep over us; a spot full of hope and peace, where nothing dies that may not be born again."—C. Hamilton Aide.

Although the increase of refinement in horticultural taste has brought into some prominence this ornamental class of plants, very few of the order Graminaceæ are suited for the garden, especially if the latter be small. Most that are worth cultivating are best kept in pots, as when grown in the border they generally present a wild, weedy appearance. Some, however, are really beautiful and graceful, and are eminently suited for the garden.

#### THE BEST VARIETIES

are:—*Gynerium argenteum*, well known and universally grown in Queensland under the name of "Pampas Grass." It is the grandest of all ornamental grasses, bearing panicles like large, silver-white feathers, on stems rising to a height of from 6 ft. to as much as 12 ft., presenting an appearance of picturesque beauty, scarcely equalled by any of our hardy plants. It has few rivals for beautifying an open space, such as a wide lawn or terrace. The plant is perfectly hardy in this country, and increases in size with freedom; it may be readily propagated by division of the large thick tussocks. The species has been known under several names, succeeding botanists having conferred fresh titles, which in turn have been superseded. Thus it has been known as *Arundo diæca*, *A. Selloana*, *Gynerium argenteum*, *G. dioicum*, *G. purpureum*, and *Cortaderia argentea*.

#### STIPA PENNATA (Feather Grass).

This is a very beautiful grass, its group of stems bearing resemblance, after blossoming, to a delicate tuft of whitish feathers, like the tail of a bird of paradise. It presents a most attractive appearance in borders, and, when cut, forms a pretty permanent in-door ornament.

#### AGROSTIS NEBULOSA (Cloud Grass).

One of the lightest and most graceful of all grasses. Its panicles, when developed in a mass, resemble a cloud resting over the ground. It is suitable for bouquets and for mixing with flowers in vases. *Agrostis pulchella* is a dwarfer species than the preceding, and more rigid; consequently of more value in bouquet making and drying for winter bouquets.

#### ERAGROSTIS ELEGANS (Love Grass).

A strong-growing, hardy annual, with broad foliage, which, with the stems, is covered with down. The panicles of inflorescence which emerge from the leaves are much branched, and are of a purplish colour. It is very useful for bouquet and vases.

**BRIZA MAXIMA (Quaking Grass).**

*Briza gracilis* and *Briza minima* (Shivery Grass) are very beautiful when bearing their heads of blossom, resembling little heart-shaped lockets suspended from delicate, thread-like stems, and moving constantly with the slightest breeze. A pot of either species, placed amongst other annuals, affords pleasing variety.

**ZEALAPONICA QUADRICOLOR GIGANTEA.**

This is a grass of dwarf bushy growth. The leaves are yellow, striped with green, rose, and dark-red. The colouration and striping are very intense.

**ARUNDO .**

*Arundo versicolor* (Ribbon Grass): This pretty, striped grass, so useful in giving effect to a bouquet, is equally effective in the open border.

*A. donax* is another striped grass somewhat like the preceding, but with stouter stems and more than 7 ft. or 8 ft. high.

**ANDROPOGON SHOENANTHUS (Lemon Grass).**

Common in many of our gardens, cultivated for the fine fragrance of its leaves.

*A. nardus* is the sweet-scented grass from which citronella oil is distilled.

**PENNISETUM RUPPELLIANUM (Purple Fountain Grass).**

This is amongst the finest and most graceful of grasses, producing a profusion of most lovely spikes on long, slender stems.

*P. macrurum* is very like Pampas grass. *P. longistylum* is a native of Abyssinia, and is one of the most elegant grasses. It has arched leaves and gracefully-curving, plume-like spikes, rising above the leaves. Very ornamental either alone or in groups.

**THE ROCKERY.**

It is only in gardens of large extent that a rockery which shall have the appearance of natural formation can be satisfactorily constructed. Still, even in a comparatively small garden, by attention to certain rules, a small and effective rockery may be made in some secluded part. The surroundings of a rockery should be in harmony with its rustic character; neither closely-mown grass nor smooth gravel are admissible in contact with it. If a path is necessary, it should be merely an irregular footpath, formed of some coarse material.

In forming a rockery the first thing to be done is to lay down a good body of suitable soil, shaped to design; then the stones, which should be of different sizes, bedded into it at various depths, odd ones, and groups of threes, being placed outside the general design. The stones should, as a general rule, be laid on their flat sides; only in a very few instances, to give variety, should two or three be thrown together, one resting on another, or with their edges, or points upwards. They should all be of the same geological formation, but may vary as much as possible in size and shape. Products of art, such as scoriæ, stucco, and the like, or pieces of stone cemented together, are altogether inadmissible, it being always borne in mind that the primary object of a rock-work is the growth of plants, and not the mere display of a heap of stones. The surface on which the rockery is placed may be also varied by excavating it into a hollow here and there.

An artificial rockery, that is given the appearance of upholding a bank of earth, should be well backed by a dense mass of evergreens, so that it may not seem to be a sham. The plants selected for putting in the rockery should include a large proportion of drooping, trailing, creeping, and climbing species. For the latter a few forked stems of trees of moderate height might be fixed at intervals. The above is taken from Adamson's "Australian Gardener."



Mr. Adamson further recommends the following lists of the kinds of plants most suitable for the purpose:—

### 1. TALL SHRUBS.

These for the highest parts:—Among conifers are the genus *Callitris*, all species; *Casuarina*, all species; *Juniperus hibernica*, *J. Oxycedrus*, *J. phoenicia*, and *J. chinensis*; *Retinospora filifera*, *R. obtusa*, *R. pisifera*, *Thujopsis borealis*, *Widdringtonia cupressoides*.

Amongst other shrubs:—*Acmena*, all species; *Agonis flexuosa*, *Backhousia myrtifolia*, *Chamaerops Fortunei*, *Doryanthus excelsa*, *Dracæna australis*, *D. nutans*, *Eugenia*, all species; *Yucca gloriosa*, *Rhus typhina*. The following are of drooping habit:—*Cytisus filipes*, *Genista monosperma*, *Cydonia japonica*, *Deeringia*, *Garrya elliptica*, *Leycesteria formosa*, *Pittosporum Tobira*, *Raphiolepis indica*, *Rhus Cotinus*, *Ribes speciosum*, *Robinia hispida*, *Paliurus aculeata*.

### 2. DWARF SHRUBS.

*Berberis dulcis*, *Capparis spinosa*, *Helianthemum*, all species; *Clianthus puniceus*, *Escallonia rubra*, *Cotoneaster microphylla*, *Forsythia viridissima*, *F. suspensa*, *Jasminum nudiflorum*, *Rulingia parviflora*, *Vinca major*, *V. minor*.

### 3. CLIMBING PLANTS.

*Ampelopsis hederacea*, *A. japonica*; *Clematis aristata*, and other species; *Ficus stipulata*, *Hedera* (the ivy), all varieties; *Roses*, all climbing sorts; *Rubus* (the Bramble), all varieties.

In sunny situations *Agaves*, *Cacti* of all kinds, *Crassulas*, *Mesembryanthemums*, *Sempervivums*, *Sedums*, and all other succulents will feel themselves at home, while for shady situations ferns would be appropriate.

Of herbaceous plants there are not a large number that would bear the exposure of a rock-work in this climate, unless shady nooks could be found for them where such things as *Convolvulus mauritanicus*, *Saxifraga sarmentosa*, and *Linaria Cymbalaria*, would be likely to thrive.

## FERNERY.

Ferns are plants that are universally admired, and, being easily grown, their cultivation has become common. Nearly all are shade-loving, and a large number are sufficiently hardy to thrive out of doors in this climate. They can be grown to a high degree of perfection in a greenhouse or an ordinary shelter shed, where they may be either planted in the open ground or grown in pots. If the shed is sufficiently large, a rockery may be formed on it, with pools, jets, and streams of water. The soil should be of good quality, enriched with vegetable mould, or much-decayed cow dung, in imitation of the natural vegetable soil of the glens or gullies in which ferns naturally luxuriate; while a compost including peat soil must be provided for those of delicate constitution. The stronger-growing species require rich feeding, and as soon as they are thoroughly established should be occasionally watered with liquid manure. The soil should not be allowed to become dry; therefore, during the season of growth heavy waterings should be given once or twice a week according to the weather. The plants should be syringed daily, or twice a day, morning or evening, during hot winds. They should be frequently examined, lest thrips or scale obtain a lodgment, which, if detected, should be immediately despatched, the thrips by means of strong soapsuds or tobacco liquor, the scale by sponging or syringing with a solution of kerosene and soft soap.

A fernery, like a rockery, should be partly or altogether hidden from the dressed parts of the garden, because, being of a rustic character, it would not harmonise with them. It might, with propriety, form a portion of the rockery, which might be terminated by the fernery. In its formation a natural glen, or fern gully, might be taken as a model for imitation; and if a stream of water



could be made to flow in a tortuous channel through the centre, a good effect would be produced. A rustic path should follow the course of the stream, partly on one side and partly on the other, crossing by means of apparently fallen boulders. As few ferns can thrive if fully exposed to the sun and wind, they must have shade and shelter, but if these cannot be obtained from trees and shrubs, then artificial means must be adopted; these generally take the form of a span frame work covered with laths or tea-tree, which, as it is anything but ornamental, and can only be looked upon as a necessary evil, should be made as light and unpretentious as possible; the covering ought to be thin, and to give increase of shade where required, climbing plants of light foliage may be trained over it in places. The dwarf sorts should be grown near the eye, and the tree ferns on the highest parts, with the exception of an occasional specimen lower down to give variety. *Dicksonia antarctica* and the New Zealand Tree Ferns require damp and shady situations, but *Alsophila australis* will succeed on dry and partly exposed places. The fernery need not be confined to ferns alone, but may have an admixture of grasses, sedges, *Phormium*, and shade-loving shrubs, such as *Griselinia* and *Coprosma*.

The following list, which might be greatly enlarged, consists of dwarf sorts that are hardy and easily cultivated out of doors:—*Adiantum assimile*, *A. Capillus Veneris*. *Aspidium aculeatum*. *A. capense*. *Asplenium bulbiferum*, *A. flabellifolium*. *A. Filixfœmina*, *A. lucidum*. *A. umbrosum* (*Allontodia australis*). *Blechnum cartilagineum*. *Cheilanthes tenuifolia*. *Davallia novae-zealandiæ*. *Dicksonia dubia*. *Doodia aspera*, *D. caudata*. *Gleichenia circinata* or *microphylla*. *G. flabellata*. *G. dicarpa*. *Lastrea*, numerous species and varieties, *Lomaria discolor* and varieties, *L. fluviatilis*, *L. lanceolata*, *L. Patersonii*, *L. procera*, *Lindsæa linearis*. *Onychium lucidum*. *Nephrodium decompositum*. *Nothoclæna distans*. *Pellæa falcata*. *Polypodium australis* (epiphyte). *P. Billardieri* (epiphyte), *P. punctatum*. *Pteris incisa* (*vespertilionis*), *Pt. tremula*, *Pt. umbrosa*, *Pt. scaberula*, *Schizæa dichotoma*. *Scolopendrium vulgare*. The following are some of the most easily procurable Tree Ferns:—*Alsophila australis*, *A. excelsa*. *Cyathea Cunninghamii*. *C. dealbata*, *C. medullaris*, *C. Smithii*. *Dicksonia antarctica*, *D. squarrosa*. *Todea barbara*.

### THE BUSH-HOUSE.

I have already, in the introductory pages of this work, described the method of building a cheap and effective bush-house, as well as the construction of the Rockery and Fernery, but I have thought it well to enlarge further on the two latter adjuncts to the amateur's garden by adding lists of plants suitable for them, leaving it to the gardener's judgment to decide what plants require the partial shade and broken light of the Bush-house.

### PALMS.

Palms constitute the most elegant and graceful family in the vegetable kingdom. Nearly all the species are admirably adapted for hall and conservatory decoration, also for plant sheds and bush-houses, whilst most of the hardier kinds do well here outside. Amongst the latter are the "Bangolas," "Fan and Cabbage Palms," "Kentias," "Cocos," "Royal and Date Palms."

They will not stand the exposure that pines will, but invariably hold their own in any situation, when once established, and there are few gardens of any size where a suitable place could not be found for some of these very beautiful plants. Palms are most beautiful and graceful when in their young condition, when the leaves are situated only a short distance from the ground; for, in the full-grown trees, the long pole-like, naked stems, it must be owned, are exceedingly ugly, so much so, indeed, as to detract altogether from the beauty of the handsome head of fronds by which they are surmounted. They are propagated by seed, which may be sown in pots. The young plants are put out in the situations intended for them when about a foot and a half high.



The best plants are those that are raised from seed. The young seedlings can be readily transplanted without injury, and can be moved from one sized pot to another without any danger. They are very difficult to shift from the open ground after the plants have attained any size, and this is the reason why so many of the plants obtained from the scrubs around Brisbane fail to grow. It is a common failing of gardeners to wish for a large plant to start with, and generally speaking as large a plant as possible is dug up. The best sized plant to take is one that has made the second leaf, and if this is done during the summer months, the roots being placed between two pieces of damp peat, very few losses will result.

Mr. Philip Mac Mahon, Director of Forests, when in charge of the Brisbane Botanic Gardens, used to collect large quantities of palms in the Blackall Range and elsewhere. His method was to insert a deep box with three sides underneath the young growing palms, which were then left undisturbed for 12 months, at the end of which time the boxes were lifted with the palm well established, and undisturbed by removal.

The following notes on growing palms are by a writer in the "Brisbane Courier," under the *nom de plume* "Hortulanus":—

The compost most suitable for palms consists of one part heavy loam, one part leaf mould, and one part sharp sand, with a good sprinkling of bone-meal. The pots should be well drained with plenty of broken crocks, with a layer of cocoanut fibre or broken charcoal on top to prevent it choking. Palm seed should be sown as fresh as possible in shallow boxes early in the spring and covered with a sheet of glass. The young plants can be worked into small pots as soon as they have made the second leaf. Always move them during the summer months; never under any circumstances disturb them during the winter. As the plants grow they should be transferred to larger pots; use a pot one size larger each time, and on no account shift from a small pot to a large one. Palms should be kept in a small-sized pot as long as possible, and if nice shapely specimens are desired, they must be retarded as much as possible. Only repot when it is plainly evident that the plant has outgrown the pot it is in. A fine specimen can be grown in a 5-in. pot, and kept in full growth and vigour for a long time if properly looked after. When the plants have been placed in pots over 5 in. they will only require repotting every two years; but once every six months remove a considerable amount of the top soil and refill with rich compost of one part leaf mould and one part well rotted stable manure, and a good sprinkling of bone-dust. The drainage will require careful watching, as palm roots form a matted ball at the bottom of the pot, which has the effect of choking the drainage. In many instances this can be temporarily relieved by knocking the plant out of the pot, and after placing a fresh crock over the hole in the pot replace. But once the roots of the plant choke the drainage, it will be advisable to repot as early as convenient. When transferring from one pot to another, remove all the old pieces of drainage from among the roots, look over the roots well, and cut away with a sharp knife any diseased or damaged ones. If the roots are healthy and clean it is inadvisable to disturb them more than is actually necessary; but just place the ball of roots and soil in a size larger pot. Should it be observed that the roots are affected with disease (the one most prevalent among palms is a bluey-white mould which grows all over the roots), carefully wash every particle of soil and disease off with clean water. Cut off any roots that are broken or cracked, as it is in places such as this that the disease lurks, and should the roots be very closely matted remove a number so as to let the remainder have more room to spread. Replace the plant in fresh soil, and water sparingly until it has commenced to make fresh growth. Some varieties, especially the Phoenix, send their roots straight down to the bottom of the pot, and will lift the base of the plant out of the soil. It is advisable when repotting plants of this nature to cut away a considerable number of the old roots. The plants are subject to numerous leaf pests and diseases. A bright



green grub will often attack the leaves and quickly destroy the foliage. This grub can be easily discovered from the habit it has of rolling the leaves round it. Hand-picking is the only remedy. They are also subject to a number of scale pests, and the leaves must be regularly sponged with weak kerosene emulsion or Gishurst compound. When sponging, place the pot on its side on the bench, and be careful that none of the wash runs down into the soil at the base of the plant. Palms will stand for a long time in the house if regularly watered, but they should never be left long in a strong draught. They do best in a bushhouse, and a week's spell in the rooms of the house is long enough, when they should be returned to the bushhouse for a rest. There are a great number of varieties which can be grown as pot plants. The *Kentias* are the ones most commonly grown, and make very handsome specimens. *Kentia Fosteriana* is easily grown, and from its earliest stages makes a handsome specimen. As a large plant for decorative purposes it has no equal, and a big plant can be grown in a small-sized pot. *Kentia Belmoreana* is somewhat similar, but has a finer leaf, and is more suitable for table decoration. *Cocos Weddelliana* is the most elegant and handsome of all the smaller palms. Its slender, erect stem is freely furnished with graceful arching leaves of a rich green colour. This variety is slow of growth, but is beautiful even as a very small plant, and it is not subject to disease or insect pests, but if not protected is apt to be injured by a very cold snap. It really requires the protection of a bit of glass during the very cold weather. The *Arecas* are a large family, the most commonly grown being *Areca*, *lutescens*, *sapida*, and *bauera*. All make handsome plants, and are quite hardy. The best varieties of the *Phoenix* family for pot plant culture are *farinifera*, *rupicola*, *sylvestris*, and *acaulis*. *Livistona Chinensis* is the finest of the fan-shaped varieties suitable for pot plants. As this family of plants are mostly of a tropical or sub-tropical habit of growth, it is not desirable to move or interfere with them during cold weather; this is a common cause of trouble with these plants. Many persons transplant or repot them too early, and the plants have not had time to recover before they get a cold night or two, and the loss of the palm almost is invariably the result. In this climate it is soon enough to start moving them about the middle of October. As soon as one or two simple rules are understood, palms are very easy of cultivation as pot plants.

#### SOME FACTS AND FANCIES OF THE GARDEN.

Read at a monthly meeting of the Victorian Horticultural Improvement Society, Melbourne, 21st January, 1909, by Ambrose C. Neate, Malvern, Vic.

##### A PLEASING OUTLOOK.

The garden is, or should become, a perennial source of pleasure to both old and young, to rich and poor; and can be made most enchanting, according to soil, situation, and climate. It gives a family home its most attractive setting, especially in a fitful climate such as ours is, if due attention be given to the tasteful introduction of tropical foliage, such as of various palms, *Cordylines*, *Rice-paper* plants, *Bamboos* and *Bamboo reeds* (*Arundo*); combining in all bold contrasts of form, leafage, and colour; all being set off by plentifully swarded stretches of *Buffalo* or *Kentucky blue* grasses—sloping off into either walks or water marginings. This principle, as applied to large public or private grounds, is most captivating, and if generously embodied by the landscape artist in many varieties of detail will fill up the poet's ideal that:—

“All are but parts of one stupendous whole.” (POPE.)

And it may be so applied to make even a villa garden appear at least twice its measured size—by a skilful blending in it of both fact and fancy: giving ideal picturings both of natural wildness with the refining influence of art combined.

I am sure you will agree with me that these views have been very fully carried into effect in conjunction with bewitchingly curved and sweeping walks



both in our Botanical and other of our city public gardens,\* as well as in many private grounds. I need not particularise, as the ever-increasing evidences are under our gaze on every hand—of successful culture, pleasing effects, and healthful openness, combined with grateful shadings. And these, often mingled with water mirrorings, are surpassingly testified to by both artists of the pen and pencil with the work also of their true yoke-fellow—that man with an eye for the beautiful, who, with his camera, can produce a picture of land and water, mountain and glen, light and shade in our clear air, second to none in any other clime in the universe!

#### DIVERSITY IN UNITY.

By all means let us have infinite variety of both flowers and foliage; let our home-gardens contain special examples of leading lines, such as Cannas (foliage and flowers), coloured Cordylines (Palm lilies), and Arundo (Bamboo reeds) of silvery hue; Hydrangeas and Coprosmas (lighter forms), and do not fail to include *Euonymus Japonicus* (silvery and golden), and others of that class. Then, of course, we must have carnations, chrysanthemums, also roses—climbing, standard, and shrubby forms. And we may find it useful to ornament dry and rocky or declivitous places with Portulacas and Mesembryanthemums (witness the Alexandra drive for glorious exhibitions of the last named). Whilst for our fences, trellises, and outhouses, we may usefully cover them with Snail Creepers (*Phaseolus Caracalla*); Virginia Creepers (various forms of Ampelopsis); *Tecoma Guilfoylei*, and *T. McKenii*; Ivy-leaf Pelargoniums in variety, also *Mandevillea suaveolens*, *Tecomas—Capensis* and *Smithii*.

Of course, it goes without the need of testimony that every lover of a garden will have as full an assortment as possible of bulbous, tuberous, and other items, such as Gladiolus and Jonquils; Agapanthus (white and blue); also *Amaryllis Johnsonii*, &c.; then annuals, &c., such as Campanulas, dwarf Snapdragons, Phloxes (annual and perennial), Zinnias, and Asters, beside a score or so of others of small habit. All to give variety in the colouring, as well as flowers for the table. If the room be too limited, then it may be well to have but few striking plants for colour and effect. Therefore, perhaps those who pass by will say to themselves (parodying the poet)—

“Though much in little is the plot we see,  
It represents Queen Flora’s majesty.”

#### POETIC AND ARTISTIC BLENDINGS.

Cowper, who, by the way, dearly loved garden ideals, wrote—“There is a pleasure in poetic pains, which only poets know”; and we, too, may well apply this truism to time spent by way of recreation in the garden! Indeed, poetry is, as ever, the handmaid of *Art*, and both are expressed truly by the loving efforts given by the home garden enthusiast, who by filling up so profitably many hours of spare time may cause many a gleam of brightness—“many a gem of spotless ray serene”—to glisten as the result of his or her fond attentions in or out of season.

Says the Rev. James Hervey, A.M. (Meditations), “Reflections on a Flower Garden”:—“What a living picture is here of the beneficial effects of industry! by it, this neat spot is an image of Eden. Here is all that can entertain the mind or regale the smell. Whereas, without cultivation, this sweet garden had been a desolate wilderness. Vile thistles had made it loathsome, and tangled briars inaccessible. Without cultivation, it might have been a nest of serpents and the horrid haunt of other venomous creatures. But the spade and pruning knife in the hands of industry have improved it into a sort of terrestrial paradise.”

The value of easily curved walks of an S pattern is in the more ready blending therewith of sloping ground, general bold groupings of plants, and open grassy spaces. A walk of this class should always give a reason for the

\* The Fitzroy Gardens specially should be named in connection with the late Mr. John Guilfoyle, who died very recently. He effected many improvements therein.



sweep—viz., by being made to skirt a Rockery or clump of trees, or even a single specimen Palm or other tree, and should not let its terminating point be seen; indeed, there should be a succession of surprises! Let such a walk lead circuitously to or from a gateway, to or from a house or rustic structure, or lose itself in going closely past an assumed (therefore created) obstacle, right into a dell—on again to a public way—approaching it with marked suddenness. There should be a complete blending of Art with Nature in all picturesque garden work as far as is possible. Well, therefore, may each one, fond of his or her garden, and after much gratifying success therein, say with Landor:—

“Nature I loved, and, next to Nature, Art;  
I warmed both hands in the fire of life!”

In other words, “Let your love of Art find its expression in the sympathetic efforts of your hands, as the outcome of your ennobled fancy, combined with and testifying to the facts of experiences.”

#### EXPERIMENTAL JOTTINGS.

No true lover of a garden ever became proficient in any sense of the word who did not either test the advice tendered or plan out some new way for himself. Every garden should teem with evidences of experiment. Some plants, do what you may, will not thrive in a given sunny or shady, windy or sheltered spot; and they may not love either a shady or clayey soil—*e.g.*, I have a *Lilium Auratum* and an *Amaryllis Johnsonii*, both of which suffered severely from the heat of last summer; these were with some others of a bulbous nature removed to a southern and shady position, under shelter of the brick house wall, and they are bidding fair to give floral appreciation of the change. Then I had to cancel such hardy items as *Linarias* in favour of dwarf Snapdragons on a hot and exposed western border, fringing the same with those glorious though short-lived *Portulacas* (*P. grandiflora*). Then, as to bigger forms of vegetation, what excellent effects can result from the multiplying by root pieces of Rice-paper plants (*Aralia papyrifera*), and also with the “Chinese tree of heaven” (*Ailanthus glandulosa*). A plant of this was put in, where its summer shelter was much needed—when no thicker than a lead pencil, and a mere twig in height; well, in 14 months, by care as to its uprightness of growth, it developed to a total height of 12 ft. by actual thickness of stem at 4 ft. from the ground of 2 in. (diam.). It is now surmounted with a fine wealth of frondage to be usefully “dropped” in favour of “more light” in winter, &c. But, beware where you put such in a small garden. It is a useful *servant*, but may sometimes become a bad *master*. NOTE.—It “stools” very much unless checked and guided (with limitations).

Pepper trees (*Schinus molle*) have also received both praise and blame as tenants of the garden, but nothing, in my judgment, can equal their gratifying shade, and the use to which they can be put for hiding out ugliness in back premises. Certainly no plants lend themselves more amiably to the efforts of the pruner—expressing, indeed, their gratitude (so to speak) by fringings and pendulous branchings of a most graceful kind. They grow, too, so rapidly, and stand heat where nothing else would do so well.

That “standard” and other forms of rose trees have been successfully transplanted in summer time, proves the wisdom of further trials, but only in case of necessity, of course. In November last a plant of *Saffranot* had to be taken away from its place—it would have been destroyed—and, being purposely denuded of foliage, the roots were spread out, wagon-wheel like, and dry earth was simply *poured* in around the stem and over the roots and rootlets—then well incorporated with them. A “basin” of soil was then ringed round the plant, whilst a thorough soaking of water was given and repeated, with the result of renewed leafage, growth, and evidence of flowering. A *Zinnia elegans* of good size, having been dragged up by the roots, was brought me by a little girl some time back in summer time. It had very fine blooms. Being nipped back, it was planted again as above stated, and



grew well, yielding quite a crop of flowers. The same plan was also applied to Mignonette, &c., whilst a small lawn was repaired with Buffalo grass in the same way, and success followed.

Now, many years since, there was in the Botanic Gardens a piece of ground called the "experimental bank." In this plot the late Baron Von Mueller placed various kinds of utilitarian trees and shrubs, such as the "Queensland Nut" (*Macadamia*), Guavas, Olives, Basket (and other) Willows, Pea Nuts (*Arachis*), and many other things of interest for supplementary culture, and he skirted the top of the bank with Buffalo grass (*Stenotaphrum glabrum*) as an edging. In this spot a young office assistant was sometimes engaged. Well, one day the junior thought it wise to trim and shape this band of grass. (This species was then rare enough in the Gardens, and almost new to Victorian lawns, &c.). But the Baron happened to come along soon after the operation, and not approving, as his extended (or uptended) arms testified, he almost pathetically cried out—fearing the extermination of the edging—Oh! my beautiful Buffalo—my beautiful Buffalo!!

No one ever thinks now of attempting to move (transplant) any of our Australian gum trees, yet Mr. Guilfoyle once had a good "try," for he found a very likely example (I think it was *Eucalyptus doratoxylon*, 18 ft. in height), which had grown on a slope, and right upon a bed of cement like gravel, thus its roots extended horizontally. Well, it came away all right, and was replanted, but neither care then nor after attention could save it, and it gradually died off. In any case, in its old position, it must have been sacrificed—being in the way of building improvements. This dictum seems to apply also to most, if not all, of the Acacias, to very many of the Proteaceæ (including Banksias or Honeysuckles), and, if of any size, all the She Oaks (Casuarinæ), excepting, perhaps, many young and small growing—mostly herbaceous—plants, where they can be lifted with "balls" of earth. There are many examples of these in the Botanic Gardens—successfully transferred from the Grampians and other homes of indigenous species.

#### AUSTRALIAN PLANTS FOR "HOME" GARDENS.

What can exceed in beauty the various elegant forms and many shades of colour, as shown by the varieties of *Eucalyptus ficifolia*! and, we might add, the white and pink forms of *E. calophylla*, whilst there are many other examples of gums well worthy of a larger place in our park lands, &c., than now prevails.

The old fable, as in the school books of 50 or 60 years ago, stated that all "Australian flowers have no scent." But our present knowledge of the facts proves that we have many examples of odorous flowers—viz., troops of Acacias (over 300 species); and one has only to name the *Boronia megastigma* to smile on account of the error referred to. Then, as to colour, one has only to think of the Waratah of New South Wales (*Telopia speciosissima*), and that of Tasmania (*T. truncata*), and to remember many of the Proteaceæ, such as Grevillias, Hakeas (e.g., *B. laurina*), and the "Native Heath" also (*Epacris*); then the Hollyhock-like Hibiscus—*H. splendens* and *H. heterophyllus*. And would that we had in cultivation (for it should do well) that lovely Swainsonia—McCullochiana (Rose-pink) of Western Australia. It was introduced to cultivation by Baron Von Mueller in, I think, 1869 or 1870, but he did not succeed in keeping it, and the nurseryman who had it supplied to him did not succeed in placing it—or only did so for a time. (NOTE.—Seed should be available from a West Australian nurseryman, &c.)

The Order *Swainsonia* was named after the late Mr. W. Swainson, F.R.S., and contains the kinds (*S. lessertifolia* is one of them) that poison horses and stock. I have here a printed copy of a Botanical Report by him, submitted to the Legislative Council by His Excellency's command, 1st November, 1853. This document treats of the native plants of Port Phillip (Victoria), and contains but little, if anything, in the way of helpful fact, I



am sorry to say. Though the compiler claimed to have had no books of reference, yet he gave both names and descriptions with much certainty and in profusion. I quote a few examples:—

- (1) *Eucalyptidæ* (properly Eucalypts) = 1,520 species, &c. *Fact*: Only 150 species (say), and perhaps as many varieties.
- (2) *Casuarinæ*, called by him "true pines" (?) = 213 species. *Fact*: Not more than 20 or 25 species known to be in existence.

No wonder a great Botanical Authority in England termed Mr. Swainson's descriptions by a word of emphatic disapproval, so the Baron once told me; but I did not just then know the direct reason until I had seen the "Report"—as to the plants "described, collected, and handed to the Curator of the Botanical Gardens"—the late Mr. John Dallachy (whom I knew in the "fifties" and "sixties.") (NOTE.—Mr. Swainson's qualifications lay, it would seem, more in the way of Zoology than Botany, *vide facts*, "Vict. Botanists," J. H. Maiden, F.L.S., in "Vict. Naturalist," 5th November, 1908).

I can only add, as to the long years of Botanical discovery since 1853, that they prove how valuable have been the labours of talented men like Baron Von Mueller (Victoria), F. M. Bailey, F.L.S. (Queensland), W. Woolls (New South Wales), J. H. Maiden, F.L.S. (Director, Botanic Gardens, Sydney, New South Wales), and many others, who have given unquestioned and valuable elucidations bearing on the indigenous plant life of Australia.

#### PICTORIAL REFERENCES TO OUR NATIVE FLORA.

We may (by time limit) only touch the margin of this "Field of the Cloth of Gold," remarking that when Mrs. Meredith illustrated, many years since, both with pen and pencil, by artistic picturings of the plants of Tasmania, she did a valuable duty to posterity in her two volumes, "Bush Friends." (I have the names, &c., of all the plants she describes in my M.S. copy.) Then there is Miss Charsley's Australian Flowers (in the Public Library, I think). It contains many beautifully coloured plates, all from her own paintings (and I was reminded by one of the members of this (Vict. Hort. Impt.) Society of Mrs. Rowan's fine sketches of our Australian plants, after the reading of the paper). Then there is the work of Miss North, a most excellent series of Australian and other (tropic) pictures, for which a special building has been erected (Kew Royal Botanic Gardens, London). It may also interest lovers of our wild flowers to know that a lady well known to my family circle—Miss Allen—resident in South Yarra, was a skilled delineator of many New South Wales plants, when on travel, both as to actual form and colouring. Would that there were many more such ladies of leisure who could thus improve the time with entertaining side pleasures such as described, and put on record such cheery evidences as these ladies have done!

In keeping with these remarks, let me invite your attention to an unrivalled collection of native plants (some of you may not be aware of it (?)) formed many years since by the present Director in the Botanic Gardens. It occupies a considerable space skirting the southern and western sides of the enclosure. There are besides many other examples—borders, classified groups, on lawns and otherwise. It is of large interest, as are other classes of plants, to students of Pharmacy and others.

As to private lands and public gardens and parks in mild climates, everywhere what fine effects could be produced by the groupings of Australian trees and shrubs—*e.g.*, *Eucalyptus citriodora* (Lemon-Scented Gum), silver barked, against *E. leucorylon*, almost black barked: *E. ficifolia*, which, with its blaze of red or pink flowers, against specimens of *Grevillea robusta*, having golden trusses of bloom. Then think of the "Kootamundra Wattle" (*Acacia Baileyana*), with its glaucous foliage and golden spring flowers, in conjunction with the fine foliage of the "Norfolk Island tree fern" (*Alsophila excelsa*); and, by addition, let some such plants as the "Queensland Spear Lilies"—*Doryanthes excelsa* and *D. Palmeri*—be used, to give the pleasing variety of their bold foliage.



## OUR SEASONS.

It may be well to remember specially, when studying the helpful horticultural literature of the British and South Europe mother lands, that you must almost reverse the instructions, seeing both here and "at home" there are direct opposites of summer and winter as with the other two seasons. So, if your English garden guide book says sow or plant in April or May, you must perforce think of September or October in Australia!

Several years since (1893) the late highly-esteemed Government Astronomer and Director of the Observatory, Melbourne, Mr. R. L. J. Ellery, F.R.S., gave me the following helpful note:—

"The shortest day is the same for all Australasia, and nearly the same within a few hours for every year. The seasons also may be taken as similar to Melbourne, that is—

Spring begins 23rd September;

Summer begins 21st December;

Autumn begins 20th May, or 20th March in Queensland;

Winter begins 21st June, or 24th June in Queensland.

Though we can do so much here, which would be impossible out of season, say, in Great Britain or in other parts of Europe, &c., it will be well to follow the usual instructions as to deciduous trees and shrubs—viz., as to Autumn, Winter, or Spring planting and sowing (and as affects annuals and perennials in the open in Spring time). But, with regard to evergreens, much liberty may be taken, allowing that the roots must be well spread out, well intermixed with the soil, and plentifully dosed with water. And wonders can be and have been done (as before referred to in this paper) with lawns, special styles of planting, and landscape garden improvement, nearly all the year round here under skilled guidance—hot summer days alone excepted—to produce effects in a few days or weeks that would be impossible otherwise, or only attainable by many years of patient waiting. But, then, these things are only to be done in a large way by mental and physical skill, and must be left very much to millionaires and public bodies, who in this way have power to accomplish what would be left undone without the power of the purse! (Many of us do not possess this.)

## SOME CLOSING WORDS.

1. Now is an excellent time to put in live, *i.e.*, growing pieces of Buffalo grass for lawns; and it is generally most satisfactory to do this sort of work, say, from October to January.

2. The very best for general lawn work next to the foregoing is the "Kentucky Blue Grass" for lasting surfaces in this climate. It may be either sown or freely transplanted (if you have a surplus stock) in any moist weather. It "stools" well, but does not run all over the garden as does the Couch (or Doub) grass.

3. Do not be afraid, however, of the interspersion of the "Couch"—it fills up well and helpfully—in bare or difficult spots, of course, away from the borders; but take care! and resist as if it were the very plague those dreadful underground roots and overground runners of the native Buffalo grass (*Paspalum distichum*), excellent, by the way, for swampy places and river or lake embankments to prevent action of flood water. In a lawn it is an awful scourge, as your borders and flower beds will soon inform you, seeing every joint will multiply with great rapidity!

4. And, finally, always keep your lawn as a splendid emerald framing, in which to set your floral treasures out to the best advantages of form and colour. No treatise, lecturette, or essay can ever exhaust all that could be said of the experiences of all real owners of a garden. When treading noiselessly on the velvet sward, we may look very cheerily into the faces of our gentle constituents with some thought of their great Originator, and say—

"Your voiceless lips, O Flowers, are living preachers!"



## Forestry.

### FORESTS OF CHINA.

In the February number of the Journal we gave a short extract on the forests of Japan from the Journal of Agriculture of Natal. That Journal contrasts the condition of forestry in that progressive country with the position in China.

"China," says the writer of the paper alluded to, "holds a unique position as the only civilised country which has persistently destroyed its forests. What forestry has done in other countries stands out in bold relief against the background of China, whose hills have been largely stripped clean of all vegetation, and whose soil is almost completely at the mercy of floods. Trees have been left only when they could not be reached. Almost the sole use for lumber is the manufacture of coffins. The heavy 2 or 3 in. planks for this purpose are so scarce, and the cost of transporting them by coolies is so high, that they sell for 8s. 4d. and 12s. 6d. apiece.

"Nowhere in the world is the forest cleaned off down to the very soil as it is in China. When the trees are gone, the saplings, the shrubs, and even the herbage are taken. Slender poles are used to build houses; inconsiderable shrubs are turned into charcoal. In the lower mountains of North-eastern China, where the stripping process has reached its extreme phase, there is no trace of anything worthy of the name of forest. In the graveyards and courts of the temples a few aged cedars have been preserved by the force of public opinion, and poplars and fruit trees planted about dwellings are protected as private property by the peasant owners.

"In the province of Shantung, where deforestation is practically complete, fuel and fodder for cattle are literally scratched from the hill sides by boys, who go out from villages with their iron rakes in autumn to secure winter supplies. Grazing animals, searching every ledge and crevice, crop the remaining grass down to the very roots.

"A dearth of wood is not the only forlorn result of forest devastation; a dearth of water and the ruin of the soil follow in its train. In Western China, where forest destruction is not yet complete, enough vegetation covers the mountains to retard the run-off of the rains, and return sufficient moisture to the lower levels, where it can be reached by the roots of crops, and where springs are numerous. But, on the waste hills of Eastern China, the rains rush off from the barren surfaces, flooding the valleys, ruining the fields, and destroying towns and villages. No water is retained at the higher levels, so that none is fed underground to the lower soils or to the springs. As a result, even on the plains, the water level is too far beneath the surface to be used. Without irrigation and the ingenious terracing of hill sides, by which the rains are made to wash the soil into thousands of miniature fields whose edges are propped up by the walls, agriculture would be entirely impossible. Even irrigation calls for the immense labour of drawing the water from wells.

"In a word, the Chinese, by forest waste, have brought upon themselves two costly calamities—floods and water famine. The forest school lately opened at Mukden is the first step in the direction of repairing this waste, so far as it may now be repaired."

This woeful state of affairs should set Queenslanders thinking of what may be the result of the clearing of scrub lands, and of ringbarking thousands of acres of forest land, which have been vigorously prosecuted for many years.



In this connection, we think it well to republish a paper we wrote in November, 1900, on the subject of

## FORESTS AND MOISTURE.

By THE EDITOR.

Although much has been written on the question of the connection between forests and rainfall, and many arguments, *pro* and *con*, have been brought forward, we seem to be no nearer to unanimity on this important subject. But there are cases in which argument brings enlightenment. It is easy to affirm that forests do not increase the rainfall or moisture of a district, but there are local conditions which have to be taken into consideration which materially modify any statement in favour of or against increased rainfall due to the timber covering of the soil. It needs no very acute reasoning to show, by an examination of our own forests and scrubs, that they are important factors in restraining evaporation, retarding or even preventing heavy floods, and the washing away of hill-sides, and consequently retaining the supplies of rivers and springs in the bowels of the earth. So much has been granted by all who have scientifically considered the matter. Compare a clear, open eucalyptus forest with no undergrowth with a dense vine scrub. The winds have free play through the former, whilst the heavy timber and undergrowth of the latter present an almost impassable barrier to even heavy gales. What is wind? Wind is air in motion, and air in motion is a very rapid worker. As it sweeps over the bare surface of land or water, it carries away with it more moisture than is evaporated by the heat of the sun. Still air, on the contrary, very slowly absorbs moisture. The air in the scrubs is still, and hence the moisture in the thick carpet of humus in such places is very slowly evaporated, and is being constantly renewed by heavy dews and showers of rain, which supply far more than is carried off in the air. This gives the superabundant water time to sink slowly into subterranean reservoirs, which, being constantly saturated, are able to keep up the supplies drawn upon by streams and springs. When heavy rain is long continued, when there is little or no undergrowth, the surplus water rushes off the sun-dried surface of the soil, pours into the creeks, and swells their water faster than the rivers or lakes to which they are tributary can carry them off. Hence arise often devastating floods. In the scrubs, on the other hand, the flood waters are retarded by the undergrowth and the mat of roots traversing the soil like a close network, and before they can get away to the creeks in injurious bodies they sink through the porous soil to the regions below, and so are prevented from flooding the low-lying country.

Usually after heavy rain in Queensland, strong, drying, westerly winds sweep over the country, and the open forest is rapidly deprived of much of the moisture which has remained in the soil, and is left in perhaps a worse position than before the rains. The scrubs will not permit the drying winds to sweep through them, so that the moisture is retained in the soil. The still air above it absorbs this moisture very slowly until it has become saturated. Once the point of saturation is reached, evaporation ceases, and under certain conditions condensation and precipitation follow. This precipitation may take the form of heavy dews or of *rain*. In this sense, then, it may be asserted that forests increase the rainfall. Moist air being lighter than dry heated air, the former will ascend and assist in forming rain-clouds, which, when fully charged, and reaching a stratum favourable to condensation, must fall in the form of rain, but not necessarily in the district where they were formed. Having risen above the protecting influence of the scrub, they are caught by the winds and swept away, joining other clouds on their way. Perhaps they reach a high range, on which they impinge, and rolling upwards reach a cooler atmosphere, and at once condense and fall in grateful showers, perhaps 200 or 300 miles from the forests which gave them birth.



Professor R. C. Kedzie, Chemist of the Michigan Agricultural College, tried an experiment to obtain some measure of the relative rapidity of evaporation in a draught, and in comparatively still air. The air in one part of the chemical lecture-room was so nearly still that a feather would not move perceptibly. By opening windows in another part of the room, a strong draught could be obtained at one window, the wind blowing 12 miles an hour. Two square pieces of Turkish towelling of the same size were thoroughly wetted, just short of dripping, then weighed separately, one suspended in the still air of the room for an hour, while the other was similarly hung in the draught by the window, or in the mouth of the ventilating shaft. Both were left for an hour, then weighed again, and the loss in weight showed the amount of water evaporated in each case. The trial was made seven times, with the result that the evaporation was four times greater in the draught than in the still air. The actual amount evaporated was not the same for each hour, but the ratio of evaporation was almost identical in the whole series, viz. :—Four times as much in the draught as took place in the still air.

The reason for this is not hard to find. A volume of perfectly still air surrounding a wet body will take up moisture with progressive slowness till the air is saturated; but, if this damp air is blown away and replaced by relatively dry air, evaporation will go on with increased rapidity, and if the air is constantly renewed, as in a draught of wind, the evaporation will be more rapid. Every washerwoman knows that the clothes will soon blow dry when hung out in a stiff breeze, but will take hours if lined up indoors.

The principle of the professor's laboratory experiment, he says, will hold in the broad open of Nature. The air in contact with the moist ground will take up water till it is saturated, and then evaporation will be suspended, provided the air remains still and undisturbed. But, if this bottom air is swept away by wind, evaporation will be renewed, and the drying of the soil will again go on. The influence of trees, shrubs, and even of the grass in preserving in some degree this shallow pool of quiet air at the ground-level, and thus diminishing evaporation from the soil, may seem a trifling matter at first thought, but becomes of great moment on the large scale of Nature.

From this it will be seen that my theory is fully borne out by Professor Kedzie.

#### DEPLETION OF FORESTS IN NEW SOUTH WALES.

The Engineer-in-Chief for Railways, in New South Wales, Mr. H. Deane, has pointed out, in a paper prepared at the instance of the Minister for Works, the ever-increasing scarcity of timber suitable for railway sleepers, bridges, buildings, &c. He says:—

The forests have now almost been entirely exhausted of timber anywhere within reasonable distance from the means of obtaining railway and steamship transport. Timber-getters and sawmill owners have to push further back into the country to obtain supplies for the constantly increasing demand. Especially is this the case with ironbark, but to a greater extent it also applies to other hardwoods.

And the time is not far off when, instead of New South Wales being looked upon as a country with a superabundant area of forests, it will reach the condition of those countries where more expensive materials have to be used for construction in substitution for timber.

The importance of this step is all the greater when it is considered how large a quantity of the colony's most valuable timbers are exported to other parts of the world, and of late particularly to New Zealand, and that, with the exception of the wages paid to timber-getters and the profits of timber merchants, the colony gains nothing herself, but is gradually being drained of one of her most valuable assets, and no steps are being taken to reafforest the districts as they become exhausted.

The ignorance of the benefits to be derived from proper management of the forests is very remarkable. We are possessed of timber which in strength



and durability can vie with the products of all the world, and a large revenue could be made out of it. Forestry is, as has been happily said by Professor Bailey Balfour, a division of rural economy which ought to be the basis of a large national industry.

Forest conservation does not mean that no trees shall be cut down, but that the forests shall be cultivated as any other crop, and not wasted. Steps should be taken to prevent the spread of fire and the browsing of animals of all sorts on growing forests.

The matter is one generally for the State to take up; yet there are immense tracts under private control which would pay better as forest than as grazing land; and if proper instructions could be given, suitable schools of forestry instituted, men could be trained both for the employment of the State and to assist private owners. As the existence of even young plantations, which only their followers will reap the benefit of, will mean the growth of to them an important asset, landowners should be taught to see that it is in the interests of their property to plant and conserve.

It is perfectly clear that, if on the forest land of the eastern slopes of the main range, where such land might be worth 1s. per acre for grazing purposes, it will pay to grow timber, then, in the interior, near the railways, the poor ridges, which are not worth 1d. per acre, would, if put under cultivation for trees, yield a very handsome profit indeed.

But it must be understood this expectation can only be realised if care is taken in growing the trees. They must be started in nurseries, planted out, and, until they have grown to a considerable size, must be properly fenced off, and protected from the browsing and ravages of animals and man. Strict measures must also be taken to preserve them from injury or destruction by bush fires.

It is certain that if proper measures were taken a profitable industry could be carried on, giving employment to large numbers of men.

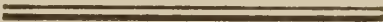
#### A REASON FOR FOREST CONSERVANCY.

That it is high time drastic measures were taken for not only nursing our forests, but for planting trees in place of those removed, will be seen from the present condition of the vast forests of the United States. There, the total forest area is estimated in round numbers at 405,000,000 acres, or 26 per cent. of the total area of the country; Alaska, 577,390 square miles, and the Indian reservations, 31,400 square miles, not being included. The present annual requirements for consumption of forest products in the United States are, approximately, over 24,000,000,000 cub. ft., made up of the following items:—Lumber market and manufactures, 5,000,000,000 cub. ft.; railway construction, 600,000,000 cub. ft.; charcoal, 250,000,000 cub. ft.; fences, 500,000,000 cub. ft.; fuel, 18,000,000,000 cub. ft.; mining timber, 150,000,000 cub. ft. At the present rate of cutting, the remainder of forest land in the United States cannot long meet the enormous demand on its resources. Of the two most important timbers for building purposes, the merchantable white pine of the north-west and of New England is practically gone, very little remaining; and there remain of the merchantable long-leaf pine of the south only about 1,500,000,000 cub. ft. The valuable ash will probably be the first to be exhausted. Walnut and tulip trees are also on the wane. Forest fires are estimated to destroy values of about 12,000,000 dollars annually, but during the year 1894 that amount was lost in two States alone—Minnesota and Wisconsin.

Most of the States have awakened to the danger of the extinction of their forests, and have special commissions for their forestry laws. There also exists a national organisation known as the American Forestry Association,



composed of delegates from all the States, which meets annually. In forty-four States the legislatures have striven to encourage tree-planting by appointing a certain day in the year, known as Arbor Day, for the voluntary planting of trees by the people. In Queensland we also have established an Arbor Day, but only for the beautifying of State school premises by the pupils. In the United States tree-planting has for its object the renovation of the forests, and is a very serious business. Large areas of timbered country, amounting in the aggregate to 21,379,840 acres, have been reserved by the State, and large sums have been appropriated for their survey and protection. Now, if an immense territory like the United States, once so heavily timbered in many parts that the idea of the forest supplies ever giving out was scoffed at as absurd, is alive to the stern fact that its timbers are practically exhausted, with how much greater reason should we in Queensland set earnestly to work to regulate the cutting of our forest and scrub timber, to preserve the young plants and saplings, to aid and stimulate their growth by judicious thinning and by planting suitable trees in various localities? Our Forestry Branch of the Lands Department has only been created of late years, but we have no doubt that, when the Conservator of Forests has had time to make a thorough examination of our remaining timber supplies, he will formulate such regulations as will have the effect of promptly putting a stop to the reckless waste at present going on in all but our protected bunya forests.



Times of Sunrise and Sunset at Brisbane, 1909.

DATE.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6 13	5 16	6 30	5 0	6 39	5 3	6 30	5 18	5 May ○ Full Moon 10 8 p.m.
2	6 14	5 16	6 31	5 0	6 39	5 4	6 30	5 19	13 „ ) Last Quarter 7 45 a.m.
3	6 14	5 15	6 31	5 0	6 39	5 4	6 29	5 19	19 „ ● New Moon 11 42 p.m.
4	6 15	5 14	6 32	5 0	6 39	5 4	6 29	5 20	27 „ ( First Quarter 11 28 a.m.
5	6 15	5 13	6 32	5 0	6 39	5 5	6 28	5 20	
6	6 16	5 13	6 33	5 0	6 39	5 5	6 27	5 21	
7	6 16	5 12	6 33	5 0	6 39	5 6	6 26	5 21	
8	6 17	5 11	6 33	4 59	6 39	5 6	6 26	5 22	4 June ○ Full Moon 11 25 a.m.
9	6 18	5 10	6 34	4 59	6 39	5 7	6 25	5 22	11 „ ) Last Quarter 0 43 p.m.
10	6 18	5 10	6 34	4 59	6 39	5 7	6 24	5 23	18 „ ● New Moon 9 28 a.m.
11	6 19	5 9	6 35	4 59	6 39	5 7	6 23	5 23	26 „ ( First Quarter 4 43 „
12	6 19	5 8	6 35	4 59	6 38	5 8	6 22	5 24	
13	6 20	5 8	6 35	4 59	6 38	5 8	6 22	5 24	
14	6 20	5 7	6 36	4 59	6 38	5 9	6 21	5 25	3 July ○ Full Moon 10 17 p.m.
15	6 21	5 7	6 36	5 0	6 38	5 9	6 20	5 25	10 „ ) Last Quarter 4 58 „
16	6 22	5 6	6 37	5 0	6 37	5 10	6 19	5 26	17 „ ● New Moon 8 45 „
17	6 22	5 6	6 37	5 0	6 37	5 10	6 18	5 26	25 „ ( First Quarter 9 45 „
18	6 23	5 5	6 37	5 0	6 37	5 11	6 17	5 27	
19	6 23	5 5	6 37	5 0	6 37	5 11	6 16	5 27	
20	6 24	5 4	6 37	5 0	6 36	5 12	6 15	5 28	
21	6 25	5 4	6 38	5 0	6 36	5 12	6 14	5 28	
22	6 25	5 3	6 38	5 0	6 36	5 13	6 13	5 29	2 Aug. ○ Full Moon 7 14 a.m.
23	6 26	5 3	6 38	5 1	6 35	5 13	6 12	5 30	8 „ ) Last Quarter 10 10 p.m.
24	6 26	5 3	6 38	5 1	6 35	5 14	6 11	5 31	16 „ ● New Moon 9 55 a.m.
25	6 27	5 2	6 39	5 1	6 34	5 14	6 10	5 31	24 „ ( First Quarter 1 55 p.m.
26	6 27	5 2	6 39	5 1	6 34	5 15	6 9	5 31	31 „ ○ Full Moon 3 8 „
27	6 28	5 2	6 39	5 2	6 33	5 15	6 8	5 32	
28	6 28	5 1	6 39	5 2	6 33	5 16	6 7	5 32	
29	6 29	5 1	6 39	5 2	6 32	5 16	6 6	5 32	
30	6 29	5 1	6 39	5 3	6 32	5 17	6 5	5 33	
31	6 30	5 0	...	...	6 31	5 17	6 4	5 33	



## Chemistry.

## ANALYSES OF FERTILISERS.

TAKEN AND ANALYSED UNDER "THE FERTILISERS ACT OF 1905."

Fertiliser.	Where Obtained.	Moisture.	PHOSPHORIC ACID $P_2O_5$ .			Potash, $K_2O$ .	Nitrogen, N.	MECHANICAL CONDITION.			Remarks.
			Water Soluble.	Citrate Soluble.	Total.			Coarse.	Middling.	Fine.	
Chloride of potash ...	Webster and Co., Brisbane ...	·29	...	...	...	58·20	...	...	...	...	Equivalent, 92·20 % KCl
Sulphate of potash, Shirley's ...	Paul and Gray, Brisbane ...	·12	...	...	...	51·95	...	...	...	...	Equivalent, 96·10 % $K_2SO_4$
Sulphate of potash ...	Webster and Co., Brisbane ...	·32	...	...	...	50·50	...	...	...	...	Equivalent, 93·20 % $K_2SO_4$
Sulphate of potash, G.S. and Co., 96 % warranted, German produce 316	Duffy Bros., Bundaberg ...	·12	...	...	...	54·25	...	...	...	...	Concls., KCl
Sulphate of potash, G.S. and Co., 35, 96 % warranted, German produce	Ditto	·30	...	...	...	52·68	...	...	...	...	Equivalent, 97·60 % $K_2SO_4$
Kainite ...	Webster and Co., Brisbane ...	2·14	...	...	...	14·28	...	...	...	...	

## SIMPLE FERTILISERS: POTASH MANURES.

## SIMPLE FERTILISERS: NITROGENOUS MANURES.

Ammonium sulphate ...	Brisbane Gas Company ...	4·32	...	...	...	...	20·60
Ammonium sulphate ...	South Brisbane Gas Company ...	1·54	...	...	...	...	21·30
Ammonium sulphate ...	Paul and Gray, Brisbane ...	·62	...	...	...	...	21·40
Sodium nitrate ...	Webster and Co., Brisbane ..	·61	...	...	...	...	16·00

BONE, BLOOD, MEATWORKS MANURES, ETC.

Dried blood, Q.M.E., D.B. 112	Campbell Bros. and Amos, Bundaberg	10.89	...	...	12.54		
Fertiliser, Baynes Bros., Brisbane	Ditto	7.85	...	21.30	5.63		
Fertiliser, C.Q.M.E. Co., Rockhampton	Wyper Bros, Bundaberg	3.99	...	20.15	4.13	6.8	75.2
Fertiliser	C.Q.M.E. Company, Lake's Creek	8.50	...	19.90	6.50		
Fertiliser	Summeelin and Co., Brisbane	6.50	...	25.00	3.59		
Bonedust, Runcorn	Campbell and Amos, Bundaberg	6.79	...	21.00	3.87	46.8	36.4
Bonedust	Queensland Fertiliser Company, Runcorn	5.05	...	21.90	4.47	21.4	61.2
Fertiliser	Burdekin River Meatworks	5.50	...	15.55	4.28		
Bonedust, Jordan, Zillmere	S. H. Eaves, Brisbane	6.95	...	24.20	3.84	20.0	30.0
Peanut fertiliser	Chinese dealers, Cairns	9.05	...	.84	6.20		

MIXED FERTILISERS, SUPERPHOSPHATES, GUANOS, ETC.

Superphosphate, No. 1	Paul and Gray, Brisbane	7.18	16.50	18.00	...		
Superphosphate	Webster and Co., Brisbane	10.69	16.80	18.90	...		
Superphosphate	Millaquin and Yengarie Sugar Coy.	11.59	17.50	19.15	...		
Basic slag	Webster and Co., Brisbane	.59	15.20	17.00	...		80.0
Cereal guano	Ditto	12.50	10.78	13.05	1.40		
Ohlendorff's guano	Gibbs, Bright, and Co., Brisbane	3.05	9.50	12.91	4.05		
Shirley's No. 3	Paul and Gray, Brisbane	7.50	14.50	16.25	2.16		
Shirley's No. 4	Campbell and Amos, Bundaberg	4.21	14.00	16.00	4.10		
Shirley's No. 5	Paul and Gray, Brisbane	4.40	13.20	15.30	8.75		
Shirley's No. 7	Ditto	6.11	13.00	16.50	1.35		
Shirley's No. 11	Ditto	5.24	12.50	14.90	7.49		
Shirley's No. 18	Ditto	2.81	6.50	14.10	6.76		
MX fertiliser	Millaquin and Yengarie Sugar Coy.	18.51	...	7.37	7.75		
Yates' plant food	Burns, Twigg, and Co., Rockhampton	6.36	14.45	17.00	6.70		
							Soluble in Wagner's ammonium citrate soln.

J. C. BRÜNNICH,  
Chemist to the Department of Agriculture and Stock.



## Tropical Industries.

### EXTRACTION OF OIL FROM SEEDS.

From the following letter, communicated to the "Indian Trade Journal," 3rd December, 1908, by Mr. Louis Hoffmann, chemist and oil mill engineer, Calcutta, on the extraction of oil from oleaginous seeds by chemical process, it would appear that the methods at present adopted are crude, wasteful, expensive, and obsolete. In his letter he describes the "ghannies," as the plants in working operation in Calcutta are called.

"Here," he says, "is a waste of money, material, labour, and steam. We see a large area covered with some hundreds of revolving pots, each holding but a few pounds of seed. Apart from the considerable cost of such a large plant, the repairing and labour runs into large figures. A powerful (of course non-condensing) engine is the moving spirit in the show. The whole place is dirty and greasy, and looks anything but like a mill. The oil oozing out at the bottom of the grinding pots is led into a small tank, to be sold in its crude state. I have seen one native concern called an oil mill; I do not yearn to see another.

"There are also mills worked by Europeans for the purpose of crushing linseed. Even in these I noticed a great indifference as regards saving labour, cleanliness, and working on modern lines. It seems to me that it is rather a question of getting through a larger quantity than the plant is supposed to do than of making a profit by careful work. No wonder that linseed-crushing does not pay! What a difference between the plants at present in use as compared to the latest extraction plant by chemical solvents! This plant—suitable for treating oil-seeds, oil-cakes, fish bones, &c., say, 400 tons per week—consists of a 'battery' of five extracting pots, each capable of holding about 3 tons of the material to be dealt with. The shape of those pots is cylindrical, and they are arranged vertically in one line. The seed passes through a pair of horizontal rollers, and is carried up by an elevator and thence conducted by a conveyor over the 'battery.' It drops through the open manhole into the pot, and, when full, the former is tightly closed and the operation begins. In order to ensure perfect extraction, it is paramount that the material to be separated from the oil is perfectly dry. Fresh seed or cake always contain a certain amount of moisture, which must be removed, as the tiny water-cells prevent the benzine from attacking and solving the oil-bearing cells. Some makers of extraction plants of ancient date dry the material in a drying apparatus, which, apart from the cost of the plant, increases the cost of steam, and yet seldom secures perfect drying because the size of the drying plant is generally inadequate to deal with large quantities in a short time. Hence this money is mostly thrown away. Other makers do not even attempt to dry, and the result is unsatisfactory extraction. This difficulty has been solved by a new patent (Middleton-Hoffmann's) in a very ingenious and yet simple way, and the drying and extracting proceed at the same time.

"From an elevated benzine tank the solvent is led down into the bottom of the extracting pots. Inside each pot is a steam coil. As soon as the liquid benzine touches the pipes, it evaporates, and the gas penetrates the crushed seed. In about an hour the vapour works its way right through the whole pot, continuously condensing and evaporating the whole time until the whole of the contents is uniformly heated from 105 deg. to 110 deg. C. During the condensing a certain percentage of oil is solved, which collects at the bottom of the extractor; and while the heated vapour rushes through the seed, every trace of moisture is removed and carried up with the solvent vapour to be



liquefied again in the condenser and separated from the solvent by means of a separator acting upon the different specific gravities of water and benzine. In this single operation about 80 per cent. of oil is extracted. As soon as the condensing of the vapours begins, which is a certainty that the drying is complete, the liquid benzine-pipe, leading to the bottom of the extractor, is closed, and the solvent tank is connected with the *top* of the extractor, letting the solvent run *down* through the warm crushed seed. The oil left in the seed is rapidly and completely solved, and carried down towards the bottom of the extracting pot. Other makers of ancient plants now draw off the solution and distil the benzine until the extraction is finished. The great fault in this system is that during the greater portion of the process 90 to 98 per cent. of benzine has to be distilled in order to obtain a few per cent. of oil. Loss of benzine and steam is the natural consequence.

"Another feature of this new plant is that the solution is conducted from the first pot into the second, where the benzine is allowed to be thoroughly saturated before it is drawn into the still for distillation. This concentrating process is continued by coupling on the third and fourth pots. Meantime (for about three hours) fresh benzine having continuously been playing on the first pot, there is practically no oil left in the seed. In order to get the liquid benzine out of the seed, the steam coil is again heated and forces the liquid benzine to evaporate. Then live steam is introduced, which carries along the benzine vapour; and, as the seed is above 100 C., the steam passes through without condensing. This finishes the process. The manhole above the bottom plate is then opened and the perfectly dry, odourless meal is removed. The other pots are treated in the same way, and an ideal extraction is obtained.

"The extracting process lasts from 4 to 6 hours, according to the oily contents of the seed. The principal matter is the selection of the right quality of solvent, as many failures are traced to the purchase of cheap and unsuitable benzine. The advantages of extraction by solvents are said to be: (1) Unfailing yield of the whole of the oil contained in the seed, and independence of the vagaries of workmen; (2) Cheapness in working compared with the pressing system. Four hands suffice to work the largest plant. The loss of solvent should not exceed  $\frac{1}{2}$  per cent. on the weight of the material treated. The cost per ton of seed treated is said to be about R3 against R13 by pressing. The meal and the oil are perfectly free from the smell of the solvent, and the oil is bright and clear. The meal is perfectly dry, and is saleable immediately after being bagged. The cost of an extraction plant is said to be about one-third of the price of the usual pressing plant."

---

#### NEW FIBRE-EXTRACTING MACHINE.

The accompanying illustrations give a fair idea of a newly-invented decorating machine, which is the outcome of the inventor's practical experience with fibre machinery in foreign countries. The manufacturers are Messrs. Marshall and Sons, Limited, England, and the agents in Australia, Messrs. Robison Bros. and Co., Limited, South Melbourne, Victoria. The main feature of the machine is an improvement on other methods of fibre-extraction by mechanical means. The fibre machines at present on the market are, almost without exception, constructed on the "scutching" principle. This liberates the fibre by a rapid succession of heavy blows, which deteriorates the fibre by weakening it, and, in addition, makes a large percentage of "shorts." This serious defect has been overcome, it is claimed, by the inventor of the new machine, Mr. Andrews, by substituting for the beating action a gentle combing motion, which removes all useless vegetable matter from the fibres. The result is, a large output of clean straight fibre of better quality, and, consequently, of higher value than can be produced by scutching. No reversing of leaves or gear is needed, and the fibre is delivered at the end of



the machine thoroughly cleaned throughout its length. Many delicate fibres, hitherto unworkable by machinery, have been successfully dealt with by this simple invention. The only preliminary treatment required is to crush the stems or expel the bulk of moisture from the leaves. This can be done by rollers or any other flattening method. A water spray is operated during the combing process.

The principal features of the machine are: Two drums revolving in opposite directions, each working one-half of the raw material fed into the receiver. These drums are fitted with bars, set over with a number of pins, graded from coarse to fine. These gradually break up the leaves or stems and comb the fibre to any degree of fineness required.

The pins clean themselves automatically at each revolution of the drums.

After crushing, the leaves are fed into the machine as shown at right angles to their length; they are brought into position for the action of the combing pins by the continuous motion of two chain-conveyors, which traverse the drums. The first conveyor holds one-half of the leaves or stems until the remaining half is completely combed; this cleaned half is then automatically grasped by the second conveyor and carried along the second drum. As regards output, plants of a fibrous nature differ so materially in structure, strength, and a quantity of fibre that it is impossible to put forward figures on this point which will be accurate for all varieties. But, from tests which have been made, it is estimated that with effective crushing and intelligent feeding the machine will treat from  $2\frac{1}{2}$  to 5 tons of green material per day of 10 hours. That is to say, that given sisal leaves weighing 3 lb. each and yielding 1 oz. of fibre the output of fibre would be from  $466\frac{1}{2}$  lb. to 933 lb. per day of 10 hours. The driving power needed is from 7 to 9 h.p.

We do not know the price of the machine. The Lehmann (Manchester) No. A machine costs £65 in Manchester, and will turn out 750 lb. of clean fibre per day of 10 hours.

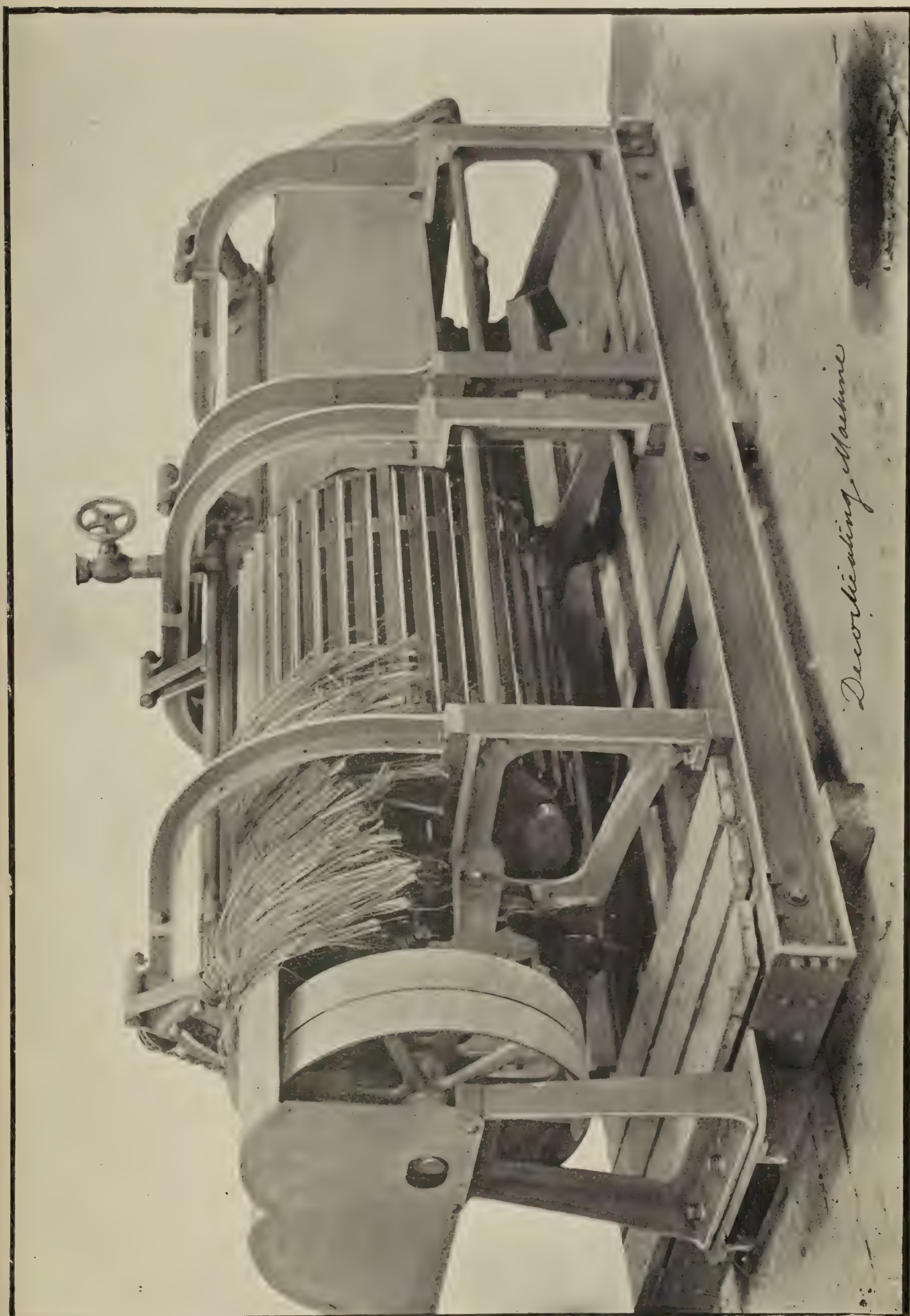
---

### DESTRUCTION OF PRICKLY PEAR.

What appears from authentic accounts to be a most effective instrument for the destruction of prickly pear has been brought under our notice by the inventor, Mr. C. L. Kirby, of Geera, near Barcaldine. It is a brass cylinder, weighing from  $4\frac{1}{2}$  to  $6\frac{1}{2}$  lb., which holds from 400 to 600 doses of any good prickly pear poison. The lower end is furnished with a convex spear, flattened on one side. This spear is driven into the pear, a twist to the right enlarges the opening, and a piston or plunger, operated at the other end, drives a portion of the poison deep into the plant. The piston will eject a single drop gently, or drive a full dose with force. Mr. Kirby stated that he and his two brothers, each operating a machine, effectually inoculated all the pear on 5 acres in  $1\frac{1}{2}$  hours. The machines are used in large numbers in New South Wales, and in a letter to Mr. Kirby from the New Zealand Loan and Agency Company it is stated that it does the work rapidly and surely. The price of the machine is, for the larger size, £3 15s., and for the smaller, £3 10s. Mr. Kirby is also the inventor and patentee of a rabbit destroyer, which is used largely in the South to destroy rabbits in their burrows by fumigation with carbon fumes. One gallon of carbon is sufficient to kill hundreds of rabbits, and 5 gallons, costing 25s., will serve for 8,000 charges in the machine.

---

Plate XXXIV.



*Decorticating Machine*

THE "ANDREWS" DECORTICATING MACHINE—FRONT VIEW.



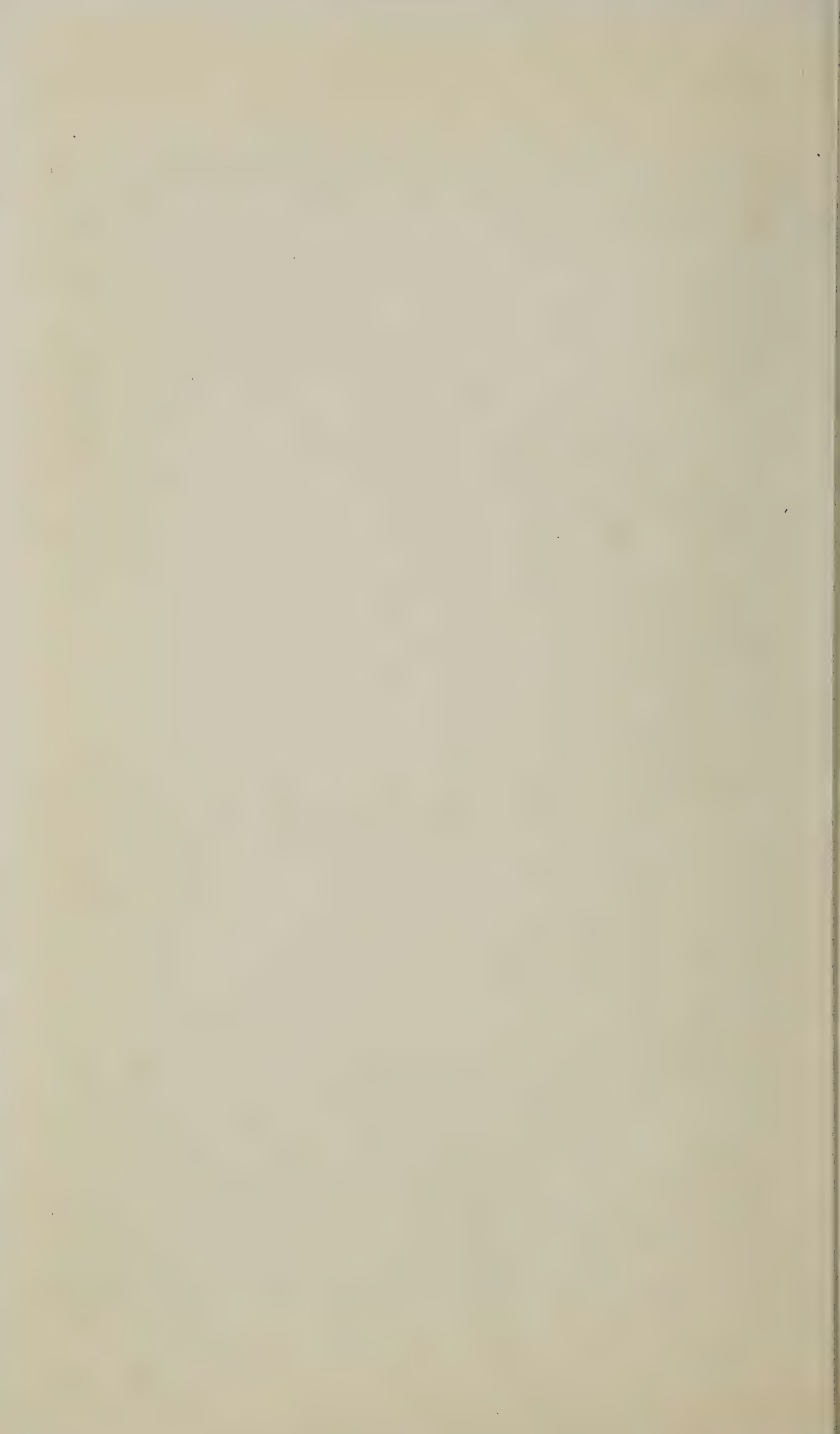
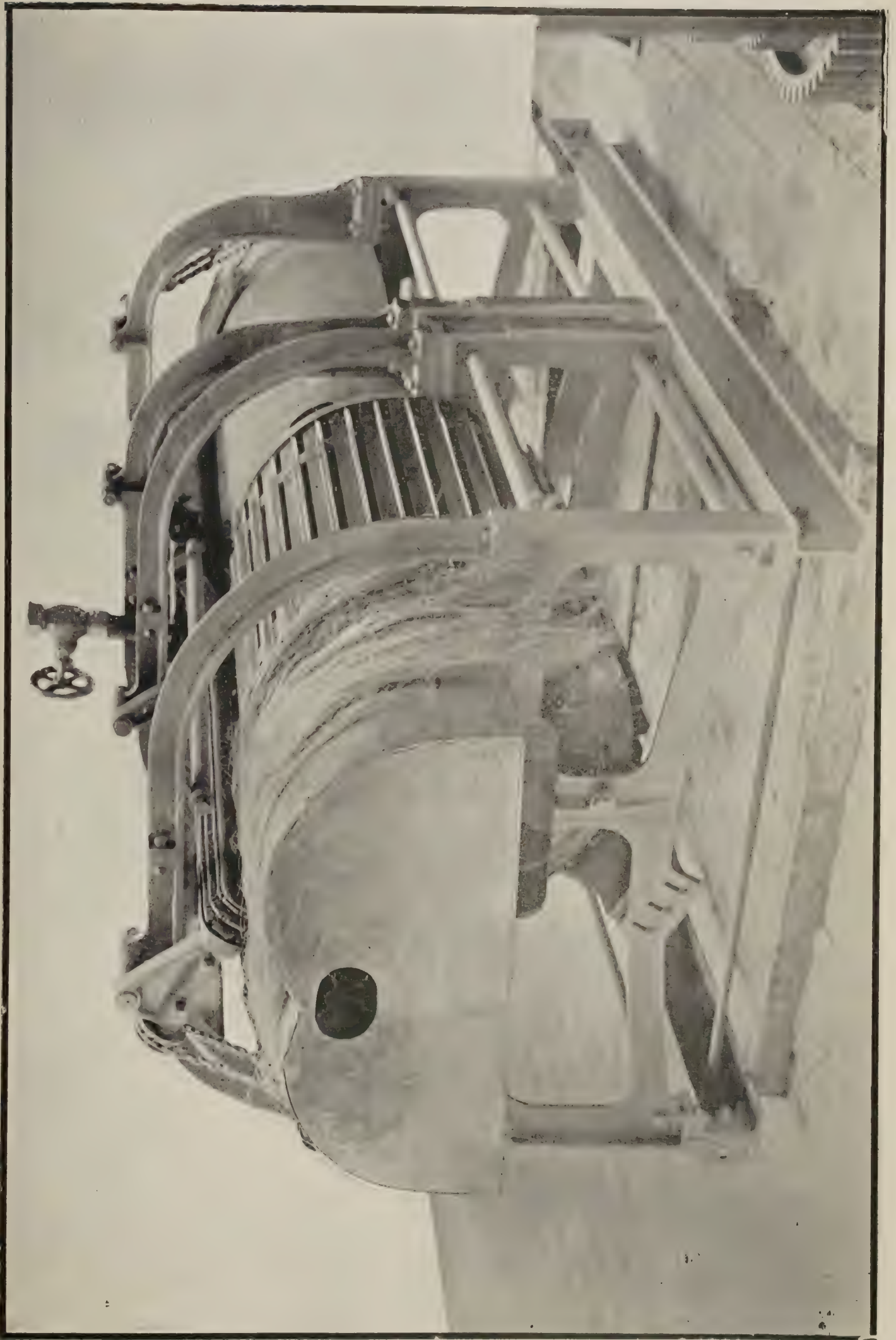
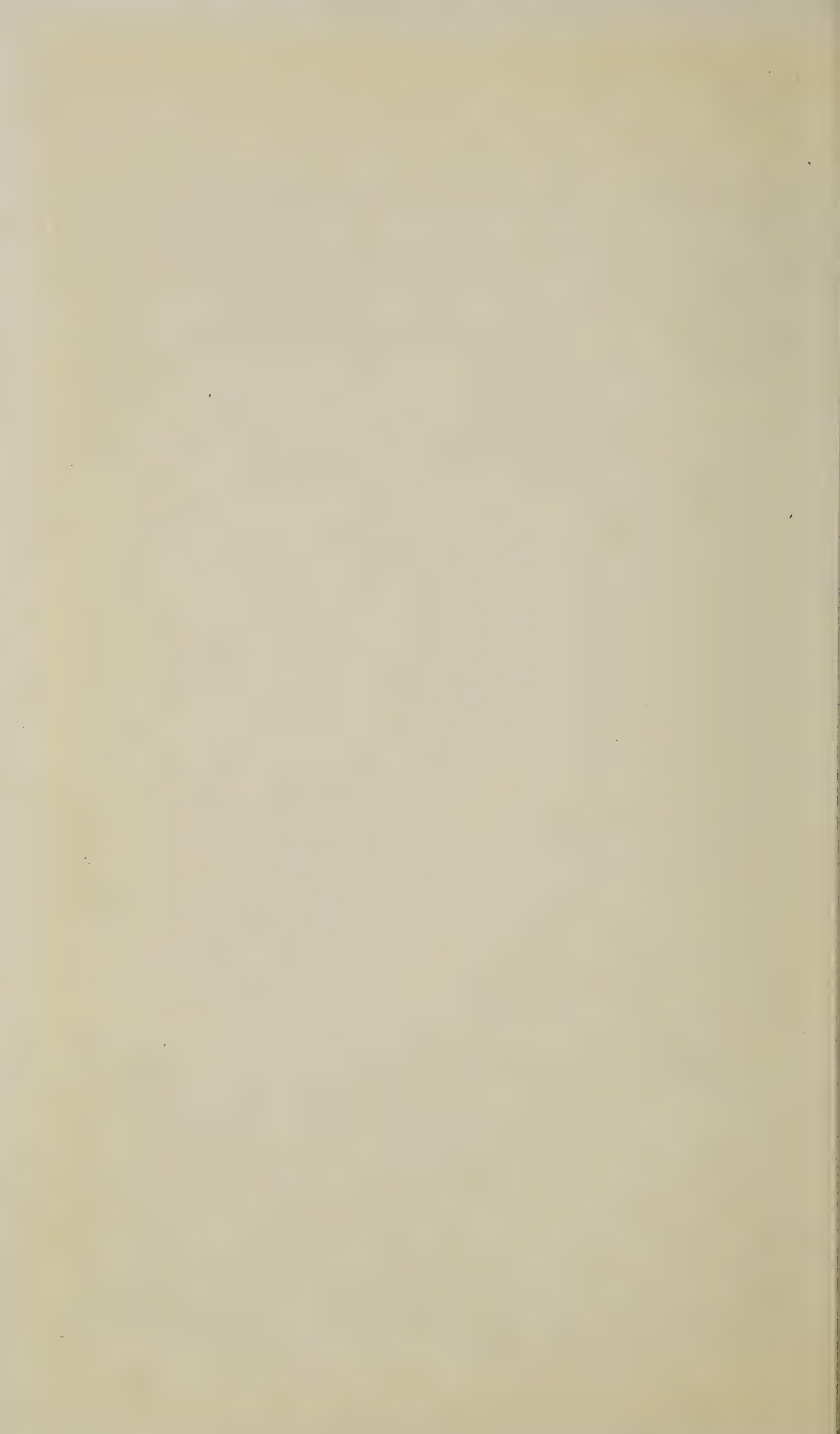


Plate XXXV.



THE "ANDREWS" DECORTICATING MACHINE—BACK VIEW.





## General Notes.

### SPARROWS.

Mons. A. Dubois, in "Science et Nature," devotes several pages to the denunciation of the sparrow, nor does he exclude the supposed friend of the agriculturist, the hedge sparrow, which does not frequent cities or even country villages, from his anathema. Many people, he declares, who are otherwise sensible, persist in believing that sparrows (at least *Passer montanus*) are indispensable to agriculture. That was the opinion of most ornithologists 50 years ago, and thus these scientists have been the cause of the introduction of the domestic pest (*Passer domesticus*), otherwise the house sparrow, into the United States and many English colonies. But 20 years ago sufficed to show the Americans the mistake they had made, and now they are striving by all means in their power to get rid of these little robbers.

It is a mistake to think that insectivorous birds are always useful; certainly they do good service, but not so much as they are credited with. Insects, like birds, are divided into the useful, the indifferent, and the noxious classes, and the latter are the least numerous species. If a bird only lived on useful insects, still, although classed as insectivorous, it would become, from an agricultural point of view, a noxious bird. But it is quite evident that a bird is incapable of distinguishing between its victims,\* and it takes all which suit its taste, as every bird has its preferences. The sparrow, for instance, will not touch certain destructive caterpillars which it does not like. The gooseberry caterpillar (*Abraxas grossulariata*) is rejected by the majority of birds, and he thinks the same objection on their part applies to the *Geocrisæ*, owing to the disgusting smell of those bugs. [Surely this proves that a bird is capable of selecting its victims.—Ed. "Q.A.J."] Consequently, it is principally amongst the useful and indifferent insects that birds seek their food. In fact, the examination of 128 stomachs of young sparrows containing insects has revealed the remains of 50 useful insects, 28 semi-useful (or indifferent), and 44 noxious insects; 3 stomachs contained remains of insects which were undistinguishable. These verifications were made by the Department of Agriculture at Washington.

In Belgium there are about 13,000 species of insects, and in this number there are only about 500 noxious, and of the latter only 118 are very destructive and about 600 useful (parasites or carnivorous), the rest are indifferent. Thus, of the 13,000 species of indigenous insects there are about 11,900 which are of no importance one way or the other to agriculture or silviculture. What harm, then, do those insects effect which live, for example, on thistles, nettles, and on a host of useless wild plants? Rather do they do us a service in ridding the land of vegetation which uselessly exhausts the soil.

It results, from what has been said, that if there is reason for protecting the true insectivorous birds, there is none for tolerating the presence of sparrows whose ravages considerably exceed their services. M. Dubois then goes on to demonstrate this proposition. To begin with, it must not be forgotten that the relative abundance or rarity of destructive insects is intermittent, and that, for many reasons, the principal of which must be attributed to the Ichneumon flies, which deposit their eggs on the skin of caterpillars and larvæ, which end by being devoured by their guests. One can realise the importance of these parasites, charged with the duty of preserving the equilibrium by confining a species which too rapidly multiplies to the just limits which Nature has assigned to them.

\* We do not agree with M. Dubois in this latter statement, which he, indeed, confutes later on. The woodcock, for instance, feeds exclusively on an insect which gives to epicures a zest for the trail of the woodcock on toast.—Ed. "Q.A.J."



Blanchard states that of 200 caterpillars collected by him, only three produced butterflies; the other 197 had been devoured by the larvæ of the terrible Ichneumons. Without the assistance of these useful auxiliaries crops would be more frequently ravaged. The caterpillar of the grape vine in France disappeared through their agency. A pear-tree in M. Dubois' garden was covered with caterpillars which devoured all the foliage. Never did he see a sparrow touch a caterpillar, although there were a number of nests of young sparrows near it. It is certain that if these birds fed on them the pear-tree would soon have been clean. This proves that sparrows will not take the first caterpillar that comes to hand, although the latter may not be hairy. Furthermore, as will be shown, as soon as fruit trees are in flower the sparrows devour the most essential organs of the flowers.

The sparrow must not only be judged by its depredations, but also on the indirect evil it occasions by driving from its domains certain birds more insectivorous than itself. It cannot certainly be denied that, so long as the sparrow is in the nest, it feeds almost exclusively on insects and larvæ, and that at that period of its life it consumes considerable numbers of them. This has given rise to the belief that this bird is much more insectivorous than graminivorous, and that its ravages are largely compensated for by the service it renders in the destruction of insects. Naturalists long defended this theory, as did M. Dubois himself, until experience showed him his mistake.

In the firm belief that the house sparrow is a bird indispensable to agriculture, the English introduced it into some of their colonies, and the Americans did the same; but both now regret it. A practical people like the Americans would certainly never destroy sparrows which they had introduced at considerable cost if they had not sufficient proof that the birds caused great damage. The whole matter resolves itself into the question: Has the damage caused by insects increased or decreased in the United States since the introduction of the house sparrow?

After 20 years' experience the Americans have concluded:—(1) That the sparrow causes great damage; (2) that the ravages by insects have rather increased than diminished; (3) that many insectivorous birds, native to the country, have been driven out by the more vigorous sparrow, which has taken full possession of their previous haunts.

M. Dubois, after pointing out the dates on which sparrows were introduced into various States of America, gives a long list of investigations into the content of the stomachs of sparrows in Germany. In England, Colonel Russell put the following questions to the defenders of the sparrow:—Why are not fields situated at a distance from habitations, and where there are no sparrows, not devastated by noxious insects? And why do these latter not multiply beyond measure in the county of Essex, where the sparrows were completely exterminated years ago? The answer is simple. The sparrow has been replaced by other insectivorous birds, which its presence had formerly displaced.

Now, a word about the hedge sparrow (*Passus montanus*). This bird has not been introduced into the New World, but it is met with all over Europe and Asia, including the Indian Archipelago, and even as far north as the Polar Circle. It inhabits the woods and mountains, and loves trees, open fields, and isolated farms, but is rarely seen in towns, although it frequents towns in oriental countries, and in Java as well. It is quite probable that if, in the old country, it lives in the woods, the reason is to be found in its having been driven out by the more robust house sparrow. The hedge sparrows are very sociable, and in autumn move about in flocks of over a thousand, mixing with other birds. Suddenly they leave in a body for some other locality, and in Spring they pair and separate. They feed mainly on grain, and cause serious damage in wheat fields, whence it is impossible to drive them, and bird-scarers have no effect on them.

## HOW TO TREAT A RUSTY TANK.

Portland cement and *boiled* linseed oil should be mixed together in such proportions as will produce a paint of the consistence of cream. All dirt should be washed off the tank, and the mixture applied with a large paint brush. After a day or two, a second coat should be applied. It will take a little time to harden, and is elastic, and will be found thoroughly effective. It is even better if applied both within and without.

## CREATION OF A NEW STRAWBERRY.

The production of a white strawberry which bears all the year round, instead of at certain seasons only, is claimed, says "Australian Field," by Hugo H. Lilienthal, a Berkeley horticulturist. He is a German who has produced various creations of an unusual kind in the way of fruit and flowers. The white strawberry, his most recent creation, is the result of a long series of experiments with crossing different varieties under different conditions. Lilienthal claims to have produced two distinct varieties of berries, which will bear through the full year, making a Christmas berry easily obtainable. One of these is white, the other red, and both are said to be of excellent flavour.

---

---

## Answers to Correspondents.

## ACACIAS AND POINCIANAS.

"ACACIA," Queensland.—

Send specimens of both to the Colonial Botanist, Mr. F. M. Bailey. Acacias and poincianas belong to two different orders botanically.

## SETARIA ITALICA.

J. PARKER, Boolburra.—

The specimen of grass forwarded for identification is *Setaria italica*, commonly known as panicum in Queensland. It is grown in most countries as a fodder and for hay-making.

## RINGWORM ON HORSES.

J. H. RYAN, Cannon Valley, Proserpine.—

Ringworm usually results from an unhealthy condition of the skin, and is, in most cases, produced by neglect of grooming or by bad food, or by any sudden change of diet, even from bad food to good. If any positive cause, such as bad forage or neglect of grooming can be ascertained to have existed, measures must be taken to rectify it, otherwise local treatment will not be of much avail. As regards local treatment, scrape each spot well with a scapula—not roughly, but sufficiently to clear off the fungus, and also clean off the hair for half an inch round the spot. When the fungus has been removed, the spot will become red and moist, but not bleeding.

Wash well with warm water and soap, and then dry it; then pass very quickly over the spot with a stick of nitrate of silver, and also very lightly over the hair on the margin of the spot. It is not necessary to keep the horse off his work unless there are any spots under some part of the harness.



DITCH MILLET (*Paspalum scrobiculatum*).

C. H., Kin Kin, Cooran.—

The specimen forwarded is described by Mr. F. M. Bailey, Colonial Botanist, as *Paspalum scrobiculatum*, or Ditch Millet. It is a very coarse grass, often met with on wet land; when closely cut or fed down, freely eaten by stock, but if allowed to stand and become old, refused except by very hungry cattle. A grass of most tropical and sub-tropical countries.

## TROPICAL CLOVER.

H. MATZAT, Mossman.—

Mr. Bailey believes that the so-called clover you describe as having been brought by you from Samoa belongs to some species of *Desmodium*. If not useful as a fodder plant, it would be likely to become a great pest to cultivators of the soil, for the clinging hairs of the pod articles would assist its seeds in being carried far and wide over the country.

## ANALYSES OF SPEAR AND BLUE GRASS AND MOLASSES.

A. L. P., Charters Towers.—

Blue grass (*Andropogon sericeus*) is a good grass, but not so nutritious as couch grass, *Paspalum*, or Rhodes grass, being rather deficient in nitrogenous or flesh-forming bodies.

Spear grass: Several grasses are called spear grass. One of the varieties is being analysed now, but analysis will not be available for some time.

Molasses contain only carbohydrates or heat-producing nutrients (about 55 per cent.), and no nitrogenous nutrients.

Dried offal from meatworks' digesters varies in composition, but contains on an average about 6 per cent. of nitrogen, corresponding to about 37 per cent. of nitrogenous material, and about 10 to 15 per cent. of phosphoric acid, corresponding to about 20 to 30 per cent. of calcium phosphate (bones).

---

# The Markets.

## PRICES OF FRUIT—ROMA-STREET MARKETS.

Article.	APRIL.					
	Prices.					
Apples (Hobart), per case ...	...	...	...	...	...	3s. to 7s.
Apples (Victorian), per case ...	...	...	...	...	...	4s. to 8s.
Apples (Local), per case ...	...	...	...	...	...	3s. to 4s. 6d.
Apples (Cooking), per case ...	...	...	...	...	...	4s. 6d. to 6s.
Bananas (Cavendish), per dozen ...	...	...	...	...	...	1½d. to 2¾d.
Bananas (sugar), per dozen ...	...	...	...	...	...	1d. to 1½d.
Custard Apples, per quarter-case ...	...	...	...	...	...	3s. to 5s.
Lemons (Italian), per case ...	...	...	...	...	...	11s.
Lemons (Sydney), per case ...	...	...	...	...	...	3s. 6d. to 7s.
Mandarins, per case ...	...	...	...	...	...	5s. to 7s.
Oranges, per case ...	...	...	...	...	...	3s. to 4s. 6d.
Papaw Apples, per quarter-case ...	...	...	...	...	...	...
Passion Fruit, per quarter-case ...	...	...	...	...	...	3s. to 4s. 6d.
Peaches, per quarter-case ...	...	...	...	...	...	...
Plums ...	...	...	...	...	...	...
Pears, per case ...	...	...	...	...	...	8s. to 10s.
Pineapples, rough, per dozen ...	...	...	...	...	...	3s. 6d. to 4s. 6d.
Pineapples smooth, per dozen ...	...	...	...	...	...	1s. to 5s. 6d.
Pineapples, Ripley Queen, per dozen ...	...	...	...	...	...	6s.
Tomatoes, per quarter-case ...	...	...	...	...	...	1s. 6d. to 2s. 3d.

## SOUTHERN FRUIT MARKET.

Apples (Hobart), per case ...	...	...	...	...	...	5s. to 6s. 6d.
Apples (Victorian), per case ...	...	...	...	...	...	4s. to 6s.
Apples (Local), per case ...	...	...	...	...	...	5s. to 9s.
Apples (cooking), per case ...	...	...	...	...	...	3s. 6d. to 5s. 6d.
Bananas (Queensland), per bunch ...	...	...	...	...	...	1s. 6d. to 3s.
Bananas (Queensland), per case ...	...	...	...	...	...	8s. to 9s.
Grapes (Queensland), Muscatels, per box ...	...	...	...	...	...	...
Lemons (Local), per gin case ...	...	...	...	...	...	8s. to 10s.
Lemons (Italian), per box ...	...	...	...	...	...	12s. to 14s.
Lemons (Italian), per half-case ...	...	...	...	...	...	8s. to 9s.
Mandarins (Local), per half-case ...	...	...	...	...	...	3s. to 4s. 6d.
Mandarins (medium), per half-case ...	...	...	...	...	...	2s. 6d. to 3s.
Mangoes, per case ...	...	...	...	...	...	...
Nectarines, per half-case ...	...	...	...	...	...	...
Oranges (Choice), per case ...	...	...	...	...	...	...
Passion Fruit (Choice), per half-case ...	...	...	...	...	...	4s. to 5s.
Peaches (Slipstones), per half-case ...	...	...	...	...	...	3s. 6d. to 4s.
Peaches (Clingstones), per half-case ...	...	...	...	...	...	3s. to 3s. 6d.
Peanuts, per lb. ...	...	...	...	...	...	5½d.
Pears (Choice), per gin case ...	...	...	...	...	...	10s. to 12s.
Pears (medium), per gin case ...	...	...	...	...	...	6s. to 7s.
Pears (China), per gin case ...	...	...	...	...	...	1s. 6d. to 2s.
Persimmons, per box ...	...	...	...	...	...	1s. 6d. to 3s.
Pineapples (Queensland), Ripley Queen, per case ...	...	...	...	...	...	6s. to 7s.
Pineapples (Queensland), choice, Queens, per case ...	...	...	...	...	...	5s. to 6s.
Pineapples (Queensland), choice common, per case ...	...	...	...	...	...	4s. to 6s.
Plums, per half-case ...	...	...	...	...	...	1s. 6d. to 2s.
Quinces, per gin case ...	...	...	...	...	...	3s. 6d. to 4s.
Rock melons, per case ...	...	...	...	...	...	2s. to 4s.
Strawberries (Local), per dozen punnets ...	...	...	...	...	...	3s. to 6s.
Tomatoes (Local), per half-case ...	...	...	...	...	...	1s. to 2s.
Water melons, per dozen ...	...	...	...	...	...	2s. to 6s.



# PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR MARCH.

Article.							MARCH.
							Prices.
Bacon, Pineapple...	...	...	...	...	...	lb.	7½d. to 9d.
Barley, Malting ...	...	...	...	...	...	"	3s. 6d. to 3s. 9d.
Bran ...	...	...	...	...	...	ton	£5 15s.
Butter, Factory ...	...	...	...	...	...	lb.	9½d.
Chaff, Mixed ...	...	...	...	...	...	ton	£5 5s.
Chaff, Oaten ...	...	...	...	...	...	"	£4 15s. to £5 5s.
Chaff, Lucerne ...	...	...	...	...	...	"	£5 to £6 10s.
Chaff, Wheaten ...	...	...	...	...	...	"	£4 10s. to £5 10s.
Cheese ...	...	...	...	...	...	lb.	6½d. to 7d.
Flour ...	...	...	...	...	...	ton	£11 to £11 10s.
Hay, Oaten ...	...	...	...	...	...	"	£5 to £5 10s.
Hay, Lucerne ...	...	...	...	...	...	"	£4 to £5 10s.
Honey ...	...	...	...	...	...	lb.	2d. to 2¼d.
Maize ...	...	...	...	...	...	bush.	4s. 1d. to 4s. 2d.
Oats ...	...	...	...	...	...	"	2s. 9d. to 4s.
Pollard ...	...	...	...	...	...	ton	5s. 15s.
Potatoes ...	...	...	...	...	...	"	£6 5s. to £6 10s.
Potatoes, Sweet ...	...	...	...	...	...	"	...
Pumpkins ...	...	...	...	...	...	"	...
Wheat, Milling ...	...	...	...	...	...	bush.	4s. 3d. to 4s. 7d.
Wheat, Chick ...	...	...	...	...	...	"	4s. 2d. to 4s. 4d.
Onions ...	...	...	...	...	...	ton	£7 10s. to £8 5s.
Hams ...	...	...	...	...	...	lb.	11d. to 1s. 0½d.
Eggs ...	...	...	...	...	...	doz.	1s. 2½d. to 1s. 6½d.
Fowls ...	...	...	...	...	...	pair	2s. 6d. to 3s.
Geese ...	...	...	...	...	...	"	5s. to 6s.
Ducks, English ...	...	...	...	...	...	"	3s. to 3s. 4d.
Ducks, Muscovy ...	...	...	...	...	...	"	3s. 4d. to 4s. 3d.
Turkeys (Hens) ...	...	...	...	...	...	"	6s.
Turkeys (Gobblers)	...	...	...	...	...	"	11s.

## ENOGGERA SALEYARDS.

Animal.							MARCH.
							Prices.
Bullocks ...	...	...	...	...	...	...	£8 15s. to £10 2s. 6d.
" (single) ...	...	...	...	...	...	...	£14
Cows ...	...	...	...	...	...	...	£6 2s. 6d. to £8 10s.
Merino Wethers ...	...	...	...	...	...	...	18s.
Crossbred Wethers ...	...	...	...	...	...	...	18s. 6d.
Merino Ewes ...	...	...	...	...	...	...	11s. 9d.
Crossbred Ewes ...	...	...	...	...	...	...	16s. 6d.
Lambs ...	...	...	...	...	...	...	15s.
Pigs (porkers) ...	...	...	...	...	...	...	36s.

## Orchard Notes for June.

By ALBERT H. BENSON, M.R.A.C.

### THE SOUTHERN COAST DISTRICTS.

The Notes of last month, referring to the care to be taken in the handling and marketing of all kinds of citrus fruits, apply with equal force during this and subsequent months till the end of the season.

Keep the orchard clean, and work the land to retain moisture. The handling of the citrus crop is the main work in many orchards, but where slowly acting manures are to be given their application should not be later than this month. They should be well mixed with the soil, so that when the Spring comes and the trees start a fresh growth a certain percentage of plant food will be available for the trees' use. Heavy pruning should be done now, whilst the trees are dormant. All large limbs should be cut off close to the main stem; the edges of the cuts should be carefully trimmed, and the whole wound, if of large size, covered with paint or grafting wax, so that it will not start to decay, but soon grow over. When the soil of the orchard is becoming deficient in organic matter, the growing of a winter green crop, such as mustard or rape, is well worth a trial. Clear the crop of fruit from the part of the orchard to be so treated. Plough the land well; work the soil down fine so as to get a good seed bed, and broadcast the mustard or rape. A manuring of 4 cwt. of meatworks manure and 1 cwt. of sulphate of potash per acre will produce a very heavy crop of green manure, and the plant food not required for the production of such crop will be still available for the trees' use in Spring.

Pineapples and bananas should all be cleaned up, and the land got into first-class order. Pineapples, where at all liable to frost, should be covered with grass or other suitable material. The growth of weeds between the rows of pines on land liable to frost is one of the best ways of encouraging frost, as frost will strike dirty, weedy ground, and injure the pines growing thereon severely, when it will do little, if any, damage where the land is kept perfectly clean—another advantage of cleanliness in cultivation.

### TROPICAL COAST DISTRICT.

Keep the land well cultivated—plough when necessary to bury weed growth, and get the surface of the ground into a state of thorough tilth, as moisture must be retained in the soil by cultivation to mature the spring crop of fruit. This applies not only to oranges and other tree fruits, but to bananas and pines as well. A good start in spring means good bunches of bananas and early ripening pineapples. Heavy pruning can be done now in the case of all trees not carrying a heavy crop of fruit, but where citrus trees are heavily loaded the pruning should be put off till after the spring crop of fruit has been gathered. The spraying of the trunks and inside of the trees with the lime and sulphur wash can be carried out, and where Maori is making its appearance the sulphide of soda wash should be used as well.

### SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all kinds of deciduous fruit trees is the chief work of the month in the Stanthorpe district. Do not be frightened to prune severely, first, in the case of young trees, so as to get strong well-grown trees instead



of straggling top-heavy trees; and, second, in the case of trees that are going off in the size and quality of their fruit. Where peaches, apricots, plums, or nectarines are only making very little new growth, and that weak, so that the fruit produced thereon is small, it is advisable to head the tree hard back, so that it will throw out some vigorous branches in Spring that will form a new head for the tree. Apples, as well as plums and apricots, are sometimes inclined to overproduce fruit spurs, which become long and straggling, and bear a large quantity of small-size fruit. A vigorous shortening back and cutting out of such spurs will have a very beneficial effect in the quality and size of the fruit produced.

Gather and burn all prunings; and, where codlin moth is present in the orchard, examine the tree carefully when pruning it, so as to see if there are any cracks, crevices, or masses of loose bark in or under which the larvæ of the moth may be hibernating. All larvæ so found should be destroyed, and if the work is carried out systematically it will tend to materially decrease the crop of moths that will hatch out the following spring.

As soon as any part of the orchard is pruned, gather up the prunings, and work the land, as a thorough winter weathering of the soil is very beneficial in its effects; and, further, it will tend to destroy many insects that may be wintering in it. The planting of new orchards or of trees to replace any that may have died, or that have been proved to be unsuitable to the district, may be continued during the month, and right on till the end of winter.

Do not prune vines in the Stanthorpe district, as it is advisable to leave the pruning as late as possible, but vine pruning can be done at any time now in the Roma or Central districts. Tree pruning can be continued during the month, and the orchard should be kept well worked. Citrus fruits can be marketed. Lemons should be gathered and cured.

---

## Farm and Garden Notes for June.

FIELD.—Winter begins on the 24th of this month, and frosts will already have been experienced in some of the more exposed districts of the Southern coast and on the Darling Downs. Hence, insect pests will, to a great extent, cease from troubling, and weeds will also be no serious drawback to cultivation. The month of June is considered by the most successful lucerne-growers to be the best time to lay down this crop, as any weeds which may spring up in the event of a dropping season will be so slow-growing that the young lucerne plants will not be choked by them.

The land should now be got ready for millets, sorghum, panicum, &c. Oats, barley, vetches, clover, tobacco, buckwheat, field carrots, and Swedes may now be sown. Some advocate the sowing of early maize and potatoes during this month, but, obviously, this can only apply to the more tropical parts of Queensland. The land may be got ready, but in the Southern districts and on the tableland neither maize nor potatoes should be planted before August, or at the earliest, in warm, early districts, at the end of July. There is always almost a certainty of frosts, more or less severe, during these months. Arrowroot will be nearly ready for digging, but we would not advise taking up the bulbs until the frosts of July have occurred. Take up sweet potatoes, yams, and ginger. Should there be a heavy crop, and consequently a glut in the market, sweet potatoes may be kept by storing them in a cool place in dry sand, taking care that they are thoroughly ripe before digging. The ripeness may be known by the milky juice of a broken tuber remaining white when dry. Should the juice turn dark, the potato is unripe, and will rot or dry up and shrivel in the sand pit. Before pitting, spread the tubers out in a dry barn or in the open, if the weather be fine. In pitting them or storing them in hills lay them on a thick layer of sand, then pour dry sand over them till all the crevices are filled and a layer of sand is formed above them. Then put down another layer of tubers, and repeat the process until the hill is of the requisite size. The sand excludes the air, and the potatoes will keep right through the winter. Late wheat may still be sown, but it is too late for a field crop of onions. In tropical Queensland the bulk of the coffee crop should be off by the end of July. Yams may be unearthed. Cuttings of cinnamon and kola nut tree may be made, the cuttings being planted under bell glasses. Collect divi-divi pods and tobacco leaves. English potatoes may be planted. The opium poppy will now be blooming and forming capsules. Gather tilseed (sesame), and plant out young tobacco plants if the weather be suitable. Sugar-cane cutting may be commenced. Keep the cultivator moving amongst the pineapples. Gather all ripe bananas. Fibre may be produced from the old stems. A hand machine for this purpose has just been introduced into Queensland from France, which will turn out 65 lb. of clean fibre in a day of 10 hours. The agent for the machine is Mr. A. Robinson, Civil Service Stores, Brisbane, and the price, we are informed, is £7 10s.

KITCHEN GARDEN.—Cabbage, cauliflower, and lettuce may be planted out as they become large enough. Plant asparagus and rhubarb in well-prepared beds in rows. In planting rhubarb it will probably be found more profitable to buy the crowns than to grow them from seed, and the same remark applies to asparagus.

Sow cabbage, red cabbage, peas, lettuce, broad beans, carrots, radish, turnip, beet, leeks, and herbs of various kinds, such as sage, thyme, mint, &c. Eschalots, if ready, may be transplanted, also horse-radish can be set out row.



The earlier sowings of all root crops should now be ready to thin out, if this has not been already attended to.

Keep down the weeds among the growing crops by a free use of the hoe and cultivator.

The weather is generally dry at this time of the year, so the more thorough the cultivation the better for the crops.

Land for early potatoes should now be got ready by well digging or ploughing.

Tomatoes intended to be planted out when the weather gets warmer may be sown towards the end of the month in a frame where the young plants will be protected from frost.

FLOWER GARDEN.—No time is now to be lost, for many kinds of plants need to be planted out early to have the opportunity of rooting and gathering strength in the cool moist spring time to prepare them for the trial of heat they must endure later on. Do not put your labour on poor soil. Raise only the best varieties of plants in the garden; it costs no more to raise good varieties than poor ones. Prune closely all the hybrid perpetual roses, and tie up, without pruning, to trellis or stakes, the climbing and tea-scented varieties, if not already done. These and other shrubs may still be planted. See where a new tree or shrub can be planted; get these in position; then they will give you abundance of spring bloom. Renovate and make lawns, and plant all kinds of edging. Finish all pruning. Divide the roots of chrysanthemums, perennial phlox, and all other hardy clumps; and cuttings of all the summer bedding plants may be propagated.

Sow first lot, in small quantities, of hardy and half-hardy annuals, biennials, and perennials, some of which are better raised in boxes and transplanted into the open ground, but many of this class can, however, be successfully raised in the open if the weather is favourable. Antirrhinum, carnation, picotees, dianthus, hollyhock, larkspur, pansy, petunia, *Phlox Drummondii*, stocks, wallflower, and zinnias, &c., may be sown either in boxes or open beds; mignonette is best sown where it is intended to remain.

To grow these plants successfully, it is only necessary to thoroughly dig the ground over to a depth of not less than 12 in., and incorporate with it a good dressing of well-decayed manure, which is most effectively done by a second digging; the surface should then be raked over smoothly, so as to remove all stones and clods, thus reducing it to a fine tilth. The seed can then be sown in lines or patches as desired, the greatest care being taken not to cover deeply; a covering of not more than three times the diameter of larger seeds, and a light sprinkling of fine soil over small seeds, being all that is necessary. A slight mulching of well-decayed manure and a watering with a fine-rosed can will complete the operation. If the weather prove favourable, the young seedlings will usually make their appearance in a week or ten days, thin out so as to leave each plant (if in the border) at least 4 to 6 in. apart.

---

VOL. XXII., PART 6.

[JUNE, 1909.]

Registered at the General Post Office for Transmission by Post as a Newspaper.]

---



THE

# QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE

---

EDITED BY A. J. BOYD F.R.G.S.Q.

---

VOL. XXII. PART 6.

---

JUNE.

---

By Authority:

BRISBANE: ANTHONY JAMES CUMMING, GOVERNMENT PRINTER.

1909.



## CONTENTS.

AGRICULTURE—								PAGE.
The Rise in Wheat and its Justification	...	...	...	...	...	...	275	
Grasshopper Destruction in South Africa	...	...	...	...	...	...	276	
The Grasshopper in Queensland	...	...	...	...	...	...	278	
Cultivation of the Potato	...	...	...	...	The Editor	...	278	
Cultivation of the Peanut	...	...	...	...	...	...	285	
Land Erosion	...	...	...	...	...	...	292	
WASHINGTON WHITEWASH	...	...	...	...	...	...	292	
DAIRYING—								
The Dairy Herd—Queensland Agricultural College	...	...	...	...	...	...	293	
Daily Feeding Rations for Milch Cows	...	...	...	...	...	...	293	
The Value of Grading Butter	...	...	...	...	...	...	295	
Dehorning Cows	...	...	...	...	...	...	296	
A Curious Cow	...	...	...	...	...	...	297	
Straw Butter Boxes	...	...	...	...	...	...	297	
POULTRY—								
Preparing Poultry for Show	...	...	...	...	...	...	298	
Buying Poultry	...	...	...	...	...	...	299	
DESTROYING CATERPILLARS	...	...	...	...	...	...	299	
THE HORSE—								
Gripes	...	...	...	...	...	...	300	
Ringworm on Horses	...	...	...	...	...	...	300	
HORTICULTURE—								
Flower Gardening, No. 17	...	...	...	...	The Editor	...	301	
A Lost Orchid Re-discovered	...	...	...	...	...	...	308	
THE ORCHARD—								
A Fine Pear Tree	...	...	...	...	...	...	309	
STATISTICS	...	...	...	...	...	...	309	
TROPICAL INDUSTRIES—								
Cassava	...	...	...	...	...	...	310	
Manila Hemp Machine	...	...	...	...	...	...	313	
Notes for Farmers on the Fibre Industry	...	...	...	...	...	...	315	
BOTANY—								
Contributions to the Flora of Queensland					F. M. Bailey, F.L.S.	...	316	
ANIMAL PATHOLOGY—								
Contagious Abortion	...	...	...	...	...	...	317	

## GENERAL NOTES—

	PAGE.
Fractured Bones in Dogs ... ..	320
Burning-out Stumps ... ..	321
What a Good Milch Cow Should Yield ... ..	322
The Flax Industry—Decreased Production ... ..	322
Banana Margarine ... ..	322
To Destroy Mice in the Garden ... ..	323

## ANSWERS TO CORRESPONDENTS—

Ringbarking ... ..	324
She Oak and Ti-tree ... ..	324
Dried Blood and Sweet Potatoes for Fowls—Sweet Potato Vines for Horses—Ripe Watermelons—Rough Analysis of Soils ...	324
Cost of Fertiliser for Maize ... ..	325
The "Queensland Agricultural Journal" ... ..	325

## PUBLICATION RECEIVED—

The Official Year Book of the Commonwealth, Nos. 1 and 2 ...	326
--------------------------------------------------------------	-----

## THE MARKETS—

Prices of Fruit—Turbot-street Markets ... ..	327
Southern Fruit Market ... ..	327
Prices of Farm Produce in the Brisbane Markets for May ...	328
Enoggera Saleyards ... ..	328

FARM AND GARDEN NOTES FOR JULY ... ..	329
---------------------------------------	-----

ORCHARD NOTES FOR JULY ... ..	A. H. Benson, M.R.A.C.	330
-------------------------------	------------------------	-----

TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1909 ... ..	331
------------------------------------------------------	-----

LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES ... ..	I.
---------------------------------------------------------	----

DEPARTMENTAL ANNOUNCEMENTS ... ..	VII.
-----------------------------------	------

DIRECTIONS FOR FORWARDING SPECIMENS ... ..	VIII.
--------------------------------------------	-------



**NOTICE.****Queensland Agricultural Journal.**

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,  
to cover postage.

To all other persons the annual subscription will be 10s., which will include postage.

All remittances should be made by postal notes or money orders, but where they are unobtainable stamps will be accepted, though the Department accepts no responsibility for any loss due to the latter mode of remitting.

For your convenience an Order Form is attached. A cross on each side of the Order Form indicates to the recipient that his subscription is again due.

Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

**ORDER FORM.**

*To the Under Secretary, Department of Agriculture  
and Stock, Brisbane.*

*For the enclosed\*..... please  
forward me THE QUEENSLAND AGRICULTURAL  
JOURNAL for One Year.*

*Name.....*

PLEASE *Address.....*  
WRITE  
PLAINLY. ....

*Occupation.....*

\* State amount according to above rate.

Agriculture.

THE RISE IN WHEAT AND ITS JUSTIFICATION.

The steady rise of the price of wheat, which began as far back as last June (says the "Economist" of 13th March) is beginning to attract attention outside the immediate circle of the grain trade, for there is probably nothing so needful as a cheap and plentiful supply of wheat and other cereals. Whether to the world at large wheat is more important than rice may be doubtful; but there can be little doubt that for consumers in the United Kingdom it is the most important of all foods. It is estimated that every man, woman, and child in the United Kingdom consumes on an average 6 bushels per annum, or almost precisely 1 lb. per day, in the form of bread, biscuits, or pastry.

The present rise started about eight or nine months ago, when reports began to reach Western Europe that the growing crop in Russia and Roumania was beginning to give cause for anxiety. The market was at that time in a peculiarly susceptible state, as farmers' and merchants' reserves were unusually light, owing to the defective world's crop of 1907. Everywhere reserves had been freely reduced last summer in the belief that the harvest of 1908 would redress the deficiency of the preceding year, but fate ordained otherwise, for the world's wheat crop last year was very little bigger than that of 1907, and the result has been that merchants have had no favourable opportunity during the past twelve months of restoring their reserves, which consequently remain far below a normal level. For instance, the stock of foreign wheat and flour in the ports of the United Kingdom now amounts to only 1,200,000 quarters, or about 2½ weeks' supply at the present rate of consumption. It is years since the ports were so bare of wheat; indeed, one must go back to the Leiter corner year to match the present figures, and it is estimated that other stocks and stores are depleted, for millers, dealers, and bakers were all similarly influenced by the optimistic estimates of the growing wheat which prevailed last summer. The British—probably, too, the German and French—farmers have also contributed to the present situation, for they have run down their reserves, having marketed in the first six months of this season probably three-fourths of the crop harvested last August. Yet it is doubtful whether the whole of the rise in price since last June can be fairly attributed to the absence of sufficient reserves. The first thing to do is to ascertain definitely what the rise actually amounts to for the leading classes of wheat dealt with in England, together with similar data for other countries. The following are the prices on some of the principal world's markets now and eight months ago:—

					1 July, 1908.	March, 1909.	Difference.
					s. d.	s. d.	s. d.
British corn average	...	...	...	per quarter	30 11	34 10	+ 3 11
Liverpool, Contract wheat	...	...	...	per cental	7 2	8 0½	+ 0 10½
" No. 2 Red Winter	...	...	...	"	7 1½	8 5	+ 1 3½
" Australian	...	...	...	"	7 10	8 2½	+ 0 4½
" Argentine	...	...	...	"	7 3	8 1½	+ 0 10½
" Baker's flour	...	...	...	per sack	25 6	29 6	+ 4 0
Paris, wheat	...	...	...	per quarter	37 7	41 7	+ 4 0
" flour	...	...	...	per sack	38 9	36 3	+ 2 6
Berlin, wheat	...	...	...	per quarter	45 10	49 1	+ 3 3
" rye	...	...	...	"	41 1	38 1	- 3 0
Budapest, wheat	...	...	...	"	39 4	49 6	+ 10 2
Chicago, wheat	...	...	...	per bushel	85c.	115c.	+ 30c.
Winnipeg, wheat	...	...	...	"	101½c.	109½c.	+ 8c.



From the foregoing it will be observed that the price of wheat is now roundly about 4s. per quarter (the equivalent of  $\frac{1}{2}$ d. per quartern loaf) higher than it was eight months ago; in Chicago the rise amounts to 30 cents per bushel, or 10s. per quarter, a figure which also represents the rise in Budapest. In Berlin the price of wheat has risen to 49s. per 480 lb., but luckily for the German working classes there was a bumper rye crop, which made the rye duties largely inoperative, and the price of rye has fallen to 38s. per 480 lb. If the British working classes could be persuaded to eat rye bread, they could be cheaply fed, as the free-trade price of this cereal is extremely low, about two-thirds of the price of wheat.

One potent reason why wheat has risen in price and continues at the higher level is the growing belief that in Argentina the recent harvest has proved far less abundant than the preceding season's, and is much below the early pre-harvest forecasts. Last November it was confidently predicted that the crop would furnish an exportable surplus of at least 20,000,000 quarters, or 2,500,000 quarters more than the preceding season's. The Buenos Ayres agent of the Liverpool "Corn Trade News" was the first to sound a note of warning, cabling in October, and again in November, that frost in the northern region and drought in Southern Buenos Ayres had wrought serious injury to the young wheat plants. The message concluded with a forecast of 13,000,000 quarters as the probable exportable surplus, and, although this was looked upon at the time as somewhat sensational, events have satisfied the trade that it was a conservative estimate, and there are few, if any, authorities who believe now that the quantity will be reached, the general idea now being that the surplus will hardly exceed 11,000,000 quarters. The disappointment over the Argentine yield, it is believed, may suffice to account for the maintenance of the present level of prices, without making too much allowance for the effect of the manipulation at Chicago, where attempts are being made to corner the May and July deliveries—a belief which has eventuated in a certainty.

---

#### GRASSHOPPER DESTRUCTION IN SOUTH AFRICA.

The brown locust, which periodically invades the Transvaal in countless swarms, causes enormous losses to the farmers. In order to ascertain as fully as possible the amount of damage occasioned by these pests, the Agricultural Department of the Transvaal endeavoured to obtain an estimate of the value of the crops destroyed. These statistics were collected by the resident magistrates, but the amounts here given do not include the amount of the damage done to the veldt, so that the approximate damage must have amounted to nearly £1,000,000 sterling. The Transvaal "Agricultural Journal" for October, 1908, gives the amount of loss sustained in fifteen agricultural districts. The amounts range from £4,200 in Zoutpansberg to £155,840 in Pretoria and £219,421 in Potchefstroom, the total amounting to £641,860.

Such enormous losses demanded extraordinary efforts to destroy the devastating insects. The various colonies and Administrations in South Africa have consequently taken up the work in a spirit of whole-hearted co-operation, and, it would appear, with complete success. Even German South-west Africa and Portuguese East Africa, Swaziland, Rhodesia, Basutoland, and Bechuanaland appear to have entered into the spirit of the wholesale extermination of one of the greatest insect pests known to civilisation with an energy which has had magnificent results, and which, it is hoped, will ultimately rid South Africa of this fearful scourge. The universal adoption of the arsenite of soda spray as a means of extermination seems to confirm the opinion that, for cheapness, simplicity of application, and effectiveness, it cannot be surpassed.



The success attained has been attended, naturally, with heavy expense, and the total cost of the brown locust campaign throughout South Africa may be estimated, roughly, at £32,000, exclusive of the cost of material. This appears an immense sum to spend on locust destruction; but, if accurate statistics could be obtained regarding the amount of money representing the crops saved, it would probably be found that the amount expended, including even the cost of material, would amount to less than 1 per cent. of the value of the crops saved. To give an idea of the cost of a single campaign against the locusts, the "Transvaal Agricultural Journal" says that the expenditure on the Cape Colony campaign amounted to between £8,000 and £10,000. According to the report, 14 tons of arsenite of soda were used, with 14 tons of crude sugar, 3 tons of treacle, and 1,500 spray pumps were in operation. From 10,000 to 20,000 swarms were reported to have been destroyed; and 2 horses, 2 sheep, 13 calves, and 41 cattle were supposed to have met their death by arsenical poisoning.

The Orange River Colony campaign cost £7,492 2s. 10d. The material used consisted of 43 tons of arsenite of soda, 98 tons of sugar, 40 tons of treacle, and 593 gallons of Fletcher's dip; and 5,000 spray pumps were in operation.

The Transvaal Colony spent £8,312 12s. 9d. on its campaign; the Rhodesian Colony, £4,630; and Basutoland, £1,850, exclusive of cost of material.

To give some idea of the enormous swarms of locusts to be dealt with, it is stated that one swarm alone was fully 15 miles across in front, and it took nearly three days to pass a certain point.

How the campaign is annually conducted is well told in the Journal from which we take the foregoing account of the work:—The swarm destroyed was a very large one, covering an area 500 yards long and 200 yards wide. They were in the hopping stage, and travelled closely packed together. They had already consumed every green thing on the adjoining farm. A single pound of arsenate of soda sufficed to destroy the whole swarm. The poison was mixed with 4 lb. of brown sugar, and dissolved with hot water in a boiler. Then cold water was added until a quantity of 12 gallons was made up. Six ordinary bundles (about 36 lb.) of green barley was soaked in it for about 15 or 20 minutes. The barley was not entirely immersed, but each bundle was loosened so that each stalk could fully absorb some of the liquid, of which about one-third was absorbed by the barley.

By waving flags the swarm was brought to a standstill close to the boundary of the farm. Then the barley was thinly scattered both in front of and among the grasshoppers, in the following manner:—Single stalks were scattered in thin rows over the swarm, each stalk in a row at a distance of about 4 ft. from the other, and each row of stalks 10 yards from the next row. In front the stalks were laid thicker. In this manner the barley was distributed over the major portion of the swarm. The rear of the swarm was not interfered with, as there was not sufficient barley. This was, however, of no consequence, as later on the grasshoppers closed up towards the front, and so were enabled to reach the poisoned bait.

As soon as the poison had spread amongst the swarm they came to a sudden halt. There was no need for further flag waving, as the grasshoppers no longer showed any desire to spread over the field. The creatures attacked the barley with avidity. Every stalk was covered with hundreds of grasshoppers, which were all poisoned. Before sunset numbers of the insects appeared sick, but so far none had died.

About 8 gallons of the poisoned fluid were left over. This was used in the following manner:—In the evening a number of grasshoppers, where they were the thickest, were killed by blows from bushes. The bushes were steeped in the poison, and thus the hoppers were plentifully sprinkled with it. On the



same evening the remains of the poisoned barley were carefully collected and burnt.

Next morning about one-third of the hoppers were dead, and the survivors were busily devouring them. No more poison was needed. Thenceforward the destruction proceeded automatically. In four days the whole swarm was annihilated. It is remarkable that birds which for two days had fed on the dead hoppers did not seem any the worse for it. The work was very easy, two white men and two natives having been employed only two hours over the business. From the moment the poison was strewn over the swarm, they made no attempt during the four days to move on.

---

### THE GRASSHOPPER IN QUEENSLAND.

The grasshopper, although not so destructive or so numerous in this favoured State as in South Africa, is nevertheless sometimes very much in evidence. In 1904 we witnessed a campaign against them, when millions of "hoppers" visited the Isis district, at Childers. Mr. T. H. Wells, of Farnboro', made a very successful raid against them, when in the hopping stage, by driving them into shallow pits, about 25 ft. long. Long strips of calico were stretched on the rear and on both sides of the pit. Then a drive was started by a line of kanaka boys, who, armed with bushes, drove the hoppers before them till they fell into the pit, when they were speedily disposed of. Before this drive the grasshoppers so destroyed the sugar-cane leaves that nothing but the midrib was left (see illustration in this Journal, Vol. XV., p. 570). Many years ago we travelled from Georgetown to Cardwell with a detachment of native police, and at one point of our journey, near Parish's Springs, we encountered such a vast swarm of flying locusts that progress was impossible for half an hour at least, and the horses were as much alarmed by the noise made by the insects during flight as by the smart blows they received from them as they flew near the ground.

There is, however, one point in connection with the destruction of locusts by poison, and that is, the possible—indeed, highly probable—destruction of valuable insectivorous birds. The value of such birds to the farmer is incalculable, and if, during the nesting time, the parent birds are destroyed by feeding on the dead and dying locusts, what must become of the thousands of little nestlings who depend upon them for food? We have been told that in the Riverina district there is strong opposition to the poisoning of noxious animals, owing to the disastrous effect on bird life. This is a phase of the question which has only in one instance, above quoted, been touched upon in the articles we have quoted above, but it surely cannot have escaped the attention of the ornithologists and entomologists of the South African colonies, and it would be highly interesting and instructive to Australians to hear their opinion on this matter.\*

---

### CULTIVATION OF THE POTATO.

By THE EDITOR.

Next to the cereals, the potato is probably the most important food plant grown for man. It is a native of America, and was brought to England between the years 1580 and 1585 by Sir Walter Raleigh, from Virginia. It was received, however, with great disfavour; and the Church condemned it as an unholy article of diet, seeing the race and place from which it originated. It was not until the year 1805 that, by the exertions of Dr. Buchan, it became popular. In France it was quite neglected until a certain gardener,

---

\* It will, however, be noted that in the Transvaal operations above described, the birds which fed on the dead hoppers did not suffer any inconvenience.



*Plate XXXVI.*

FIGHTING THE GRASSHOPPER IN THE ISIS DISTRICT.





who had grown some and found no sale for them, induced one of the kings of France to wear a potato blossom as a button-hole. This at once popularised the despised potato in that kingdom. Chemically, the potato consists of starch, gluten, and woody fibre, with, of course, water. On the authority of the late John Wilson, Professor of Agriculture, Edinburgh, an 8-ton crop of potatoes, taken from 1 acre of land, removes from the soil in which the tubers were grown—of the bases of alkaline earths, 90 lb. of potash, 8 lb. of soda, 5 lb. of lime, 7 lb. of magnesia; and of acids, 34 lb. of sulphuric acid, 20 lb. of phosphoric acid, 10 lb. of hydrochloric acid—in all, 170 lb. of inorganic matter. This was for tubers alone; and, if an equal quantity were allowed for the tops, the quantity taken from the soil would be about doubled.

#### MANURES.

It is, therefore, evident that, to grow potatoes to perfection, the foregoing constituent elements must be present in the soil. Professor Wilson found the best results to be obtained by preparing the soil early, and applying phosphatic and potash manures some time before planting, in the proportion of about 150 lb. to the acre. At the time of planting, nitrate of soda is sown in the drills at the rate of 1 cwt. per acre, and from  $\frac{1}{2}$  to  $\frac{3}{4}$  cwt. at earthing-up time.

On light, poor, sandy soils, nitrogenous manures in the form of sulphate of ammonia should be supplied at the rate of from 140 lb. to 170 lb. to the acre—one-half to be used at the time of planting, and the other half at the final earthing-up.

The matter of farmyard manures in growing potatoes is a somewhat vexed question. Undoubtedly farmyard manure is good, provided that it has been properly fermented and well decomposed; but there is nothing more fatal to good results with potatoes than putting fresh manure and potato setts together, for the young plant can never force its way through the fermenting mass of decay consequent upon slow decomposition.

Some interesting experiments, made in England by Mr. E. B. Hodley, Agricultural Superintendent to the Wilts County Council, threw considerable light on the matter of the use of artificial manures. The seasons were dry ones, and therefore more favourable to farmyard manure than to artificials, the yield from its use being considerably in excess of that obtained from the heaviest dressing ( $12\frac{3}{4}$  cwt.) of mixed artificial manures. Where nitrogen, phosphoric acid, and potash have been applied in artificials, excellent crops have been obtained; but the heaviest crop of all was 14 tons per acre as the average of four years, grown where 8 tons of farmyard manure and 4 cwt. of sulphate of ammonia per acre were applied. The complete chemical manure was applied on different plots at the rate of 4 cwt., 8 cwt., and 12 cwt., respectively. Taking the averages for the four years, the 8-cwt. dressing proved the most economical, although the 12-cwt. dressing gave a somewhat heavier yield. When any one of the three constituents of the complete manure was omitted, there was a decrease of yield. Where the nitrate was omitted, the increase resulting from the application of kainit and superphosphate was not sufficient to pay for the cost; where superphosphate was omitted, the application of nitrate and kainit gave very little profit in excess of that obtained from the unmanured plots; and, although where kainit was omitted the yield most nearly approached that obtained from the completely manured plots, yet, even in this case, the profit was less than that obtained with a cheaper dressing of complete manure.

In conducting experiments of this nature, it should be remembered that artificial or farmyard manures will not invariably produce the same results on different soils. The rich, black soils of the Darling Downs, for instance, contain certain constituents which are wanting in lighter western or coast soils. In some there may be already a sufficiency of phosphoric acid; consequently, an application of superphosphate might prove injurious. Where



cultivation grounds are deficient, as most of them are, in phosphoric acid, it becomes necessary, in order to obtain a better crop, to secure support in the form of an easily soluble phosphoric acid. Bonedust is a phosphoric acid manure which gives this result; but superphosphates produce better and quicker results.

For potatoes, a fertiliser rich in potash is essential. For general purposes a good mixed fertiliser for this crop should consist of—Available phosphoric acid, 7 per cent.; potash, 11 per cent.; nitrogen, 3 per cent.; 700 lb. to the acre.

Sulphate of potash is mostly employed as a source of potash for potatoes. Muriate of potash is said to give even better results than the former.

Dried blood contains, on an average, 11 to 13 per cent. of nitrogen, but it is less soluble than sulphate of ammonia and nitrate of soda. Manures containing sulphate of ammonia should not be mixed with lime, nor applied to land which has been recently limed.

The value of kainit lies in its potash, of which it contains 12 per cent. It is the cheapest of the potash manures.

Following are the results of some experiments carried out by Mr. H. C. Quodling, Inspector of Agriculture, when manager of Westbrook State Farm. The manures used were—

Superphosphate, at the rate of 4 cwt. per acre.

Bonedust, at the rate of 4 cwt. per acre.

Blood, at the rate of 4 cwt. per acre.

Kainit, at the rate of 4 cwt. per acre.

One plot was unmanured, and planted with cut potatoes, and in the last plot, also unmanured, the potatoes were planted whole.

Manure.	Rate per Acre.	Weight of Seed Planted	Cut or Uncut.	Yield per Plot.	Area of each Plot.
	cwt.	lb.		lb.	acre.
Superphosphate ... ..	4	178	Cut ... ..	716	$\frac{1}{4}$
Bonedust ... ..	4	178	" ... ..	704	$\frac{1}{4}$
Blood ... ..	4	178	" ... ..	712	$\frac{1}{4}$
Kainit ... ..	4	178	" ... ..	722	$\frac{1}{4}$
Unmanured ... ..	...	178	" ... ..	751	$\frac{1}{4}$
Unmanured ... ..	...	178	Uncut ... ..	708	$\frac{1}{4}$

The best manure then, for potatoes, is a mixture of farmyard manure and some artificial. For instance, 16 tons of stable manure per acre will produce a larger crop than the most remunerative dressing of artificial manure; but, employ a mixture of 8 tons of stable manure and 3 cwt. of nitrate of soda, or an equivalent quantity of sulphate of ammonia, and a far greater yield will be obtained—in fact, such a dressing gives the greatest yield and the most remunerative results of any. If stable manure is unavailable, any artificial dressing for potatoes should contain nitrogen, phosphorus, and potash. Omit one of these (as has already been shown), and the result will be a poor crop. The omission of nitrogen will cause the greatest loss, and that of potash the least.

#### SOILS.

Of all crops grown, the potato is the one which shows the greatest content of potash in the mineral constituents withdrawn from the soil. Hence the well-known value of soil derived from granitic detritus for potato culture. In it, we have abundance of potassium silicate, derived from the decomposing felspar and slowly set free in other forms, for the uses of the plant. Where ground has been annually cropped with potatoes for many years without a rotation, it is mainly owing to the potash having been used up that the soil is not liberal in its return of tubers.

Some of our scrub soils yield a fairly good crop of tubers, but rarely over 4 tons to the acre, and these are usually somewhat watery and bad keepers, while there is frequently an abnormal growth of tops. The best potato lands in this State are the black and red soils of the Darling Downs, notably at Allora, and, nearer the coast, at Forest Hill, Laidley, and Gatton, where an 8-ton crop is no rarity. Generally, it may be said that potatoes may be grown on any soil, but that those grown on clay soils are waxy and of bad quality; light, granitic soils produce nice, mealy potatoes; and fertile loams yield the best tubers—best both in quality and quantity.

#### SEED POTATOES.

When we speak of seed potatoes, we mean potato tubers which are planted, whole or cut, to produce a crop. Potato seed is a very different thing. The potato is a *Solanum*, which produces flowers and seed vessels. The latter appear in the form of a small green apple or tomato, which contains a quantity of small seeds, and it is by sowing many thousands of these seeds that new varieties are produced, in very limited numbers compared with the enormous numbers of seeds sown, by scientific growers, who make the production of new kinds of potatoes a business, and a very profitable business it has often proved to these experimenters. Here, however, I am dealing only with the tubers or so-called seed potatoes.

There is a good deal to be studied in the selection, care, and treatment of seed potatoes, and many farmers take far too little care of them. When the summer crop is dug, the small potatoes are hauled to the barn, and either left in bags till the next planting season comes round, or else in a large uncovered heap on the floor. Then, when planting time has arrived, it is considered time enough to overhaul the heap, bags, or pit, and pick out the rotten ones. Too often the seed is found in a matted condition, owing to the potatoes not having been turned. This necessitates the whole mass being stirred up—a process which breaks off the majority of the shoots. All this means loss—a loss which can easily be avoided by being careful to turn the seed over occasionally, say about once a fortnight, or, at any event, a fortnight before planting, by which a gain in growth may be brought about. New shoots will then form, and they will be up as early as those which were planted immediately after the last turning. An important point is to plant no potatoes except those which have sprouted. This was conclusively proved to be correct at the Queensland Agricultural College, when one plot was planted with sprouted, and another with unsprouted seed. The former came up uniformly with scarcely any misses, whilst the latter plot showed an irregular growth and wide vacant spaces. In trials which were carried out for the Irish Department, at sixty-seven centres in sixteen counties, there was an average increase of 2 tons per acre from sprouting, and in the four preceding seasons the increase due to sprouting ranged from 1 ton to 2 tons 13 cwt. No stronger testimony could be desired.

Now, concerning the size of seed tubers. Opinions differ as to whether small or large seed gives the best results. A trial was made in England to settle the question. Three rows of equal length and with an equal number of setts were planted with Northern Star potatoes as follows:—

Row No. 1: 38 setts, weighing 3 lb., produced 54 lb. of potatoes;

Row No. 2: 38 setts, weighing 4 lb., produced 64 lb. of potatoes.

Row No. 3: 38 setts, weighing 7 lb., produced 92 lb. of potatoes.

Assuming that the seed cost 1d. per lb. and the produce sold at 1d., we find that row 1 returned 4s. 3d.; row 2, 5s.; and row 3, 7s. 1d.—clearly a great gain in favour of the larger setts. All were planted on the same day, in equal ground, and all had the same amount of cultivation.

This leads to the subject of planting whole or cut tubers. Here again opinions differ. Some think it a waste to plant the setts whole, while others



think the best results are got with uncut seed. Now, at the Guelph Farm, Michigan, U.S.A., experiments were made which lasted for four years, to decide the matter. These experiments are reliable, and emphatically show the advantage of planting good setts.

The experiments were made to test the effect of the number of eyes in the setts. The difference in the yield between those with one eye and those with five was found to be very considerable, amounting to about 28 bushels, the results being as follow:—

- From 1 eye, 136·41 bushels per acre.
- From 2 eyes, 144·70 bushels per acre.
- From 3 eyes, 153·13 bushels per acre.
- From 4 eyes, 162·82 bushels per acre.
- From 5 eyes, 164·37 bushels per acre.

Up to four eyes in each sett, the increase in the field is, roughly, 9 bushels for each additional eye, so that, up to that extent, the increase in eyes would be well repaid in the field.

Against this experience, I place that of a Queensland potato-grower, Mr. James Pink, of Wellington Point. He says:—It has been the practice to select for propagation the refuse of the potato heap; small, ugly, ill-shaped tubers have been considered good enough for seed, and where the result has not come up to expectations, the cry is raised that the potato is degenerating. In carrying out this practice for years, was it possible to arrive at any other result? But the very art of gardening is to lift Nature above her normal state, by raising new and improved varieties of seed, and by selection.

The method of selection is peculiarly adapted to the principle of growing from single eyes. If we take an average good-shaped potato, weighing from 6 to 10 oz., we shall find that it has from 12 to 18 eyes, which, if cut into single eyes, would give as many setts, which would naturally produce a more even sample than the same number of whole tubers of different sizes. The principle of growing from single eyes has two great advantages—namely, economy of seed, and, upon suitable, well-tilled land, a larger crop of marketable potatoes.

When whole tubers are planted, two or three eyes start into growth first; these keep the lead during the entire growing season, and from their stolons the largest potatoes are produced. The weaker eyes start later into growth, and produce only small tubers of little value; but, when single eyes are planted, the whole strength of the sett is devoted to one growth; all the young tubers are formed nearly at the same time, and the plant, having no other calls on it for nutriment, these continue to grow and form large tubers. The whole tuber produces the largest number of potatoes, but the single eye will produce the most uniform sample and the heaviest crop per acre.

With a view to ascertain the relative productiveness of tubers and setts, a series of experiments was carried out in the gardens of the London Horticultural Society. A piece of ground was divided into 4-ft. squares, and in the centre of each square was planted either a whole tuber, or a single eye, or a sett containing three eyes on the whole surface of the tuber pared off so as to leave the eyes safe, but removing the centre—a practice not uncommon in Scotland. These were, in fact, potato peelings. If we consider the results of the whole sixteen experiments as being but one experiment, we shall find their proportions expressed by the following figures:—

Whole tuber	...	...	...	...	333·38, or 2	} nearly
Single eyes	...	...	...	...	717·87, or 11	
Three eyes	...	...	...	...	613·94, or 3	
Parings	...	...	...	...	504·69, or 4	

In adopting the principle of the single-eye culture, it is requisite that the eye should be taken from large or averaged sized potatoes, for the smaller the potato the weaker its producing powers. The crown eye always grows



the strongest, and produces the largest potatoes. The eyes taken from the middle of the potato produce the best-shaped and most uniform tubers.

There are several ways of cutting the potato into single eyes. The principal thing to aim at is, to obtain a fair share of flesh of the tuber to each eye, with the least amount of cut surface. Take any potato and hold it before you with the stem end down. You will notice that the eyes are arranged around the tuber in regular ascending rotation from the bottom to the top, similar to the thread of a corkscrew. Now, take a sharp thin-bladed knife and remove the first eye by placing the knife equally distant between it and the eye next in rotation above it, sloping it to the indenture left by the stem, removing the flesh with it.

When the first eye is removed, turn the potato in your hand till the next eye appears; remove this in the same manner, and keep on turning the potato, removing each eye as it appears. These setts should be planted as soon as cut, and a little hot lime thrown over them will absorb the moisture, prevent premature decay, and also the attacks of insects. The above method could, however, scarcely be adopted by a farmer who plants large areas of potatoes. As an experiment, it is, of course, very interesting and instructive, and useful as being a simple means of increasing valuable new varieties of potatoes.

Some farmers utterly condemn the time-honoured practice of cutting up the potato into setts. One man says:—In all the trials which have been recorded of the potato crops produced from cut and uncut seed, I have never met with an instance of the cut tubers yielding the most or best. This fact must surely be generally known, and it is most surprising that it is not acted on. The process of cutting may increase the setts by about 30 per cent., but, if the time taken in cutting them, and the decreased yield be taken into consideration, no advantage whatever is secured, but the reverse. A man is far better off with a piece of land planted with 25 or even 30 cwt. of whole tubers than if it were planted with 1 ton cut up to cover the same space. If cutting the potato is done to save seed, that is a very poor reason.

In dealing with the cutting of potatoes, the large tubers are mostly cut into three pieces, the medium ones into two, and the small ones are let go whole. Plant the best and largest cut sett side by side with a whole tuber; it will invariably be found that the whole tuber produces the greatest number of potatoes, and certainly the largest ones. The difference in favour of the whole sett, I have frequently found to be 2 lb. to one plant, and imagine what this means in the case of thousands or tens of thousands of plants. The scarcer and more expensive a variety is, the more it is cut; and, consequently, the worse for the crop, and productive of certain degeneration. It appears to the writer, from his own practical experience, that, if potatoes are cut into setts with at least three eyes, the result is equally as good as when the whole tubers are planted, and that in the latter case there will be a larger proportion of small potatoes.

#### SPROUTING SEED POTATOES BEFORE PLANTING.

This is more often practised by cultivators of gardens than on the farm, but it has some decided advantages which all potato-growers may benefit by.

Seed potatoes are often badly prepared for planting, and still more often are not prepared at all. As a rule, they are kept in heaps in the barn or in bags till they are wanted in February or in August, or in a damp shed, where it is usually found that the growths have made considerable progress. The sprouts may be 2, 3, or 4 in. in length. They grow over and amongst the tubers like a network, and the greater part of them are broken off in moving the tubers, or before they can be separated. Many have little regret in doing this. They think it is necessary, and it is; but it is also exceedingly harmful, and this ought to be remembered, as deteriorated seed is always more or less unproductive. Fancy what the result would be were we to allow our corn to



sprout unduly before sowing! The excuse is that potatoes will resprout, and they will; but never so robustly as in the first instance. These long growths take a great deal out of the tuber which ought to be kept in reserve to facilitate the ordinary growth in the soil, and superfluous growth should be wholly prevented. This is easily accomplished if given timely attention, and I would urge growers that they look to their seed tubers at once.

The first treatment should consist of preventing the growths from becoming long or of a pale colour, which occurs when they are kept in the dark. Begin keeping them in the right way by turning the tubers over and removing any diseased one meets with. Do not put them in a heap again, but lay them out in a single layer on the barn floor or some other building where they will be fully exposed to the light and receive a good deal of air. This will not only check the production of long, weakly shoots, but it will green and harden the tubers, and this is a great benefit to them, as a greened tuber is much more hardy to come in contact with the soil than one that has been kept from light and air for six months or more. The growths, which will be slowly produced when laid out in a single layer and in light and air, will be short and robust and altogether different and superior to the shoots drawn up in the heap.

#### THE LEAST EXPENSIVE WAY.

This laying out is one way of sprouting potatoes which should be followed by every farmer who attempts potato culture. It is the least expensive way of treating them, and will always pay handsomely, as the first growth and subsequent results from prepared tubers are infinitely better than when they are taken straight from the heap and planted, which very many are, unfortunately. But there is another way of sprouting which is still better. This is to get a number of wood trays from 2 in. to 3 in. deep, and of any width and length; from 3 ft. to 4 ft. long, and 2 ft. to 3 ft. wide, are handy sizes. A little fine soil is put in the bottom, and the tubers are stood up on end as close as they can be packed in the trays. The ends with the eyes or buds on them are kept up, and the trays are placed in light, airy sheds, or such like places. Forcing them into growth is not advisable, the object being to get hardy little shoots on the tubers, which will not be checked when they come in contact with the soil in planting. The growths should not be more than 1 in. long when planted, and  $\frac{1}{2}$ -in. is quite as useful a length. If trays cannot be provided for all of them, there is no reason why the whole should not be laid out in sheds, or the early sorts may be sprouted in trays first, planted, and the trays again filled with late kinds. The right time to put them in trays is before growth begins, and many of the early ones will require attention at once. Sometimes there are blind tubers. When these are planted there is a blank, but in sprouting none but growing tubers should be planted. If it is seen that the growths are likely to exceed 1 in. in length before they can be planted, check them by admitting more air, but in doing this take care that a cold cutting wind does not reach them, and always be sure that they are protected from frost if that is occurring, as it still may. When the tubers are planted quite dormant it is often a long time before growth shows above ground. It might often be earlier without much chance of being injured by frost. All, too, desire their crops as early as possible if grown to meet early markets, and there is no better way of helping them on than the process of sprouting before planting, and having both tuber and growths in a sturdy, hardy condition when put in the soil. I have found this bring the crops in a fortnight or three weeks sooner at digging time than dealing with unsprouted tubers or those sprouted in the heaps, and the yield is also better from sprouted than unsprouted sets. Do not run away with the idea that there is a good deal of fiddling labour about it, and is not worth the bother, but look on it as a very important aid to successful culture and extra remunerative returns, and you will not be disappointed.



There can be no doubt that seed potatoes are weakened by the rubbing off of the shoots when they have sprouted badly, but that a good crop may be obtained from a second sprouting has often been proved. Potatoes have even been planted when every vestige of a sprout was rubbed off and not an unsprouted eye appeared, yet they sent up vigorous shoots.

#### FLOWERING AND SEEDING.

Under favourable conditions the potato plant flowers freely, and produces a green berry which contains the true seed of the plant. It is from these seeds that the different new kinds of potatoes are produced. I need not here go into the matter of the production of seedling potatoes, as what is intended here is merely instruction to young farmers who have had little or no experience previously in the art of successful potato-growing. The work of raising new varieties is expensive and tedious, and is only undertaken by certain growers (as I shall presently show when I come to the cross-fertilising of potatoes), who practically devote their lives to the business, sowing hundreds of thousands of seeds, to find sometimes only one new plant worth cultivating.

The potato plant does not produce seed so freely in this State as in colder climates, and it is, perhaps, as well that it does not flower heavily, since experiments on

#### THE EFFECT OF FLOWERING OF POTATOES,

made by a German scientist, some years ago, to ascertain whether blossoming was detrimental to the development of potato tubers, showed that the effort of the plant to provide for its reproduction by means of seeds seemed to result in a corresponding weakness in its root growth and in the size and numbers of the tubers. The experiments were carried out on a number of plots on similar soil, every condition being exactly the same. On one plot the plants were allowed to bloom as much as they liked, but the blooms of the plants in the other plots were cut off at different times. The crop that had not been topped at all was the worst yield, and the best crop was the one that had been prevented from blooming by being topped at frequent intervals. Those that were topped at the latest stage of the plants' growth were not so satisfactory as in the case of the crop frequently topped off.

[TO BE CONTINUED.]

---

#### CULTIVATION OF THE PEANUT.

Many persons on the lookout for some new payable crop in this State are turning their attention to the peanut as a source of profit, and we frequently receive inquiries concerning this product. Certainly, if such magnificent peanuts can be grown on a large scale as those grown by Mr. H. A. Tardent, at Wynnum, we should say it is a decidedly paying crop. Readers of the Journal will find several articles in past numbers showing that the cultivation of the peanut is profitable if only with a view to pig-keeping and oil-production. Bearing out what we have previously published on the subject, we find the following very interesting and instructive illustrated article on the "Origin and Domestication of the Peanut or Groundnut (*Arachis hypogæa*) in the United States," by S. A. Andrews, published in "Tropical Life":—

The origin of the peanut is the subject of much controversy, though it is considered by many that it is probably a native of Brazil. Whether this statement be true or not, it is certain that it was cultivated extensively in foreign countries before its merits were recognised in the land of its origin. The merits of this now important crop were recognised by slave-dealers, who loaded their vessels with it as food for their passengers. It was not extensively cultivated in the United States before the war between the States. The



scarcity of rations during the latter part of that historic struggle fixed the highly nutritious qualities of this peer among nuts on the attention of the individual members of the various armies then in the field, and immediately after the war much attention was given to its cultivation, especially in the South. At the present time, 7,000,000 bushels of nuts are produced annually, with a commercial value of at least 15,000,000 dollars, and it is safe to say that those grown exclusively as food for hogs, and which are not gleaned at the time of harvest, would add another 3,000,000 dollars to the value of this crop. At the present time a large proportion of the nuts are eaten, not as a regular part of the daily ration, but at odd times by all classes of our citizens.

The peanut is admirably adapted for the production of oil, and might be used advantageously for various other commercial purposes, but the demand for it as human food has been such in the past as to effectively prevent this. Since there is almost an unlimited area of country admirably adapted to its growth, not only in the United States, but in foreign lands as well, and since its cultivation is not difficult, there is no reason why it should not be grown extensively enough to meet all demands. The highly nutritious value of the peanut, and its favour among all people who are familiar with it, lend colour to the belief that its cultivation under the best modern practice will long remain a profitable business. This should stimulate and encourage many farmers, who are favourably situated, to devote a portion of their land to this important crop. Moreover, the peanut has some special advantages which make its utilisation as a rotation crop peculiarly desirable. It belongs to the family of legumes, and has, therefore, the power of gathering atmospheric nitrogen from the air in very considerable quantities. It produces also a rich and nutritious hay valuable for the maintenance of live stock. Since it is adapted for growth on rather thin and sandy soils as a rule deficient in vegetable matter, its power of largely obtaining its own nitrogen from the inexhaustible stores of the air is a most desirable attribute.

#### COMPOSITION.

The richness of the peanut as a food is better appreciated when it is stated that the kernels contain about 29 per cent. of protein, 49 per cent. of fat, and only 14 per cent. of carbohydrates. Peanut vines with the leaves contain between 11 and 12 per cent. of protein, 5 to 6 per cent. of fat, and 22 to 32 per cent. of carbohydrates. They are thus more nutritious than timothy hay, and should rank with that made from red clover. Peanut meal, which is the residue after the oil has been extracted, is a foodstuff of high value, and is appreciated and extensively used in foreign countries. It contains something like 52 per cent. of protein, 8 per cent. of fat, and about 27 per cent. of carbohydrates, and, therefore, ranks above cotton-seed meal, which is one of the most richly concentrated meals found on the market to-day. Like other legumes, the peanut contains considerable amounts of nitrogen, phosphoric acid, and potash, the latter two, of necessity, having to be largely supplied to the soil in a commercial form. But, on the whole, the peanut, as seen from the foregoing statements, is one of the most desirable and satisfactory crops which can be grown.

#### SOIL AND CLIMATE.

The peanut prefers a rather sandy, loamy soil, which should contain enough vegetable matter to make it light and porous, and also to prevent its becoming too dry. Since the trade demands a light-coloured shell, nuts of equal flavour and quality grown on other soils do not find a ready sale; and it may be proper to state at this time that the peanut can be grown on a very wide range of soils, provided they contain a sufficient amount of lime. This information should encourage many, who only wish to grow limited areas, either for grazing down by hogs or for home use, to experiment with



this important crop. There is an abundance of good peanut soil throughout the Atlantic seaboard. This area extends from New Jersey to Florida, and there is also much land on which this crop can be cultivated profitably in the Mississippi Valley. Only a small proportion of the available land is now being tilled.

The peanut will thrive under a great variety of climatic conditions provided there is a season of at least five months free from frosts. It has been thought by many that the peanut only grows well in a warm climate, but this is an error, since the nuts develop chiefly during the cool weather in the late summer and early autumn. The weather conditions most favourable to maximum production are an early spring, warm, even summer temperatures, with a well-distributed rainfall, and a comparatively dry autumn. Of course, climate has an influence on the character and composition of the nuts, since it has been demonstrated that in tropical countries a larger per cent. of oil is obtained. As to any other influences which climate may exert, but little is known, and the subject has not been as extensively investigated as the importance of this crop would seem to justify.

#### FERTILISERS.

Since the peanut is adapted for growth on a soil which is not naturally rich in any of the essential elements of plant food, the proper fertilisation of the crop becomes a matter of the utmost importance. It was found at the Tennessee Experiment Station that 60 bushels of peanuts with a ton of hay would remove from the soil about 85 lb. of nitrogen, 15 lb. of phosphoric acid, 32 lb. of potash, and 47 lb. of lime. Of this amount, about 41 lb. of nitrogen, 6 lb. of phosphoric acid, 20 lb. of potash, and 42 lb. of lime were found in the hay, and since the vines would either be left on the ground or fed to stock, and the resulting manure applied to the land, the peanut is seen to be a comparatively easy crop on the land so far as soil exhaustion is concerned. Besides, as has already been pointed out, it gathers a large percentage of its nitrogen from the air. Since it has been amply demonstrated that the yield of the crop may be greatly increased by judicious fertilisation, and since 100 bushels should be a fair average crop rather than the low yields now obtained, the importance of using sufficient amounts of all the essential elements to increase crop production and counteract the call made on the soil by the plant during the various stages of its growth becomes apparent.

The needs of a crop of peanuts may be appropriately supplied by using 1,200 lb. of high-grade acid phosphate, 400 lb. of dried fish, and 400 lb. of muriate of potash. This would give a mixture containing 1·6 per cent. of nitrogen, 10·2 per cent. of phosphoric acid, and 10 per cent. of potash. It may be stated that this ration has been found one of the most satisfactory to use on this crop. Another mixture which has been tried quite extensively is 1,300 lb. of acid phosphate, 300 lb. of dried blood, and 400 lb. of muriate of potash. This mixture would contain about 2 per cent. of nitrogen, 10·4 per cent. of phosphoric acid, and 10 per cent. of potash.

These mixtures should be used at the rate of 300 to 500 lb. per acre. Cotton-seed meal may be used to supply the nitrogen, if desirable, and kainit the potash, though, owing to lower percentages of available plant food contained in these two substances, larger amounts per acre would have to be supplied.

Many planters will find it advantageous to apply some farmyard manure to their peanut lands, since a small amount of vegetable matter mitigates the harmful influences which sometimes follow drought periods, and increases the vigour of the plant without injury to the quality or quantity of the nuts. Of course, the excessive use of vegetable matter might prove injurious, but this will seldom, if ever, happen until the entire system of rotation now in vogue



in the peanut belt changes radically. In fact, few peanut planters pay any attention whatever to the rotation of their lands, and grow the crop on the same area year after year. As a result, the nuts become small and inferior, and the vines tend to lose their leaves before maturity. A good physical condition of the soil is essential for this crop.

The importance of applying lime must also be emphasised in this connection, as there is comparatively little of the land devoted to peanuts which naturally contains enough of this important element. Lime may be applied in various forms.

Oyster shells are accessible to farmers living near the coast, and answer very well, though caustic lime is one of the best and cheapest forms in which to supply this element. Marl may be used in sections where there is an abundance of it, and it can be secured at a low enough cost. At least 30 bushels of lime may be applied per acre, and 100 to 150 bushels of marl. As a rule, lighter applications of lime made more frequently will prove the most profitable, and there is less danger of burning up the already deficient supply of humus when lighter applications are made.

A review of the fertiliser proposition, therefore, makes it clear that potash and phosphoric acid are the two most essential elements to be applied to this crop in a commercial form. That liberal applications also of these constituents prove profitable has now been fully demonstrated by scientific experiments and practical operations as well.

#### CULTIVATION.

The cultivation of the peanut is a comparatively simple matter. The seed bed should be finely pulverised to a depth of at least 5 in. Rake up the land in the spring as soon as it is in proper physical condition to work, and then harrow and roll, or use a smoothing-board, so as to obtain a level surface. Keep the land free from weeds until planting time by occasional stirring. This will tend to increase the supply of moisture in the soil, liberate plant food, and ensure a vigorous growth of the crop as soon as germination takes place.

The importance of selecting seed with care cannot be emphasised too strongly. The wonderful results obtained in the improvement of corn and various other crops indicate how much may yet be accomplished if the practice of seed selection is extended to the peanut. The seed should be selected from prolific plants, and should be carefully housed to prevent its exposure to unfavourable weather conditions. Only well developed and perfectly mature seed should be planted, and it is very important that the seed be selected before the plants have been injured by frost. They should be allowed to thoroughly cure in the open air, and should then be stored in sacks in a dry, airy loft where they will neither heat nor collect moisture. About 2 bushels of seed in the pot should be allowed for each acre of land. The time of planting depends largely upon weather conditions. Most of the crop is planted from 1st April to June (in America), but planting may be done any time after danger of killing by frost is past. The seed is usually sown in drills, especially on land that has been well handled the previous year, and is comparatively free from weeds. The rows, as a rule, are 3 ft. to 3½ ft. apart, and the kernels are placed from 15 in. to 18 in. in the drill, depending on the fertility of the land. Planting is now generally done with an implement somewhat on the order of a cotton-planter. In fact, machinery is fast superseding hand labour in the cultivation of the crop, which is an advantage in many respects, since the work can be done more perfectly, quickly, and economically by machinery.

The peanut crop is sensitive to the interference of weeds, and the land should therefore be kept scrupulously clean. It is important that the work be done early in the season, since the runners must not be disturbed after





Plate XXXVII.



1. EXPERIMENT BY DR. GRIZZARD WITH POTASH, SUPERPHOSPHATE, AND DRIED BLOOD.
2. PEANUT HARVEST IN SUSSEX COUNTY, VIRGINIA, UNITED STATES.
3. PEANUT HARVEST AT SOUTHERA PINES, NORTH CAROLINA.





*Plate XXXIX.*



PEANUTS IN STACKS, SUSSEX COUNTY, VIRGINIA, UNITED STATES.



PICKING OF PEANUTS AT SOUTHERA PINES, NORTH CAROLINA.



they form and spread. As a rule, the pods are laid by the middle of July or the first of August (in America), and hence cultivation ceases about that time. It is all the more important, therefore, that land intended for this crop should first of all be thoroughly freed of weeds, and cultivated by means of surface-working implements with sufficient efficiency and thoroughness to keep the ground mellow and free from trash until the time when cultivation ceases.

As to the method of planting in the lowlands, ridge cultivation may sometimes prove the most desirable, but, as a rule, the peanut should not be planted in a bed. This statement is made advisedly, and as the result of both observation and experimental investigation.

#### HARVESTING.

Peanuts must be harvested before frost falls, as it injures both the vines and the kernels. The crop is generally harvested by means of a plough without a mouldboard, and which has a sword-like cutting share attached to the side. The knife passes under the row without injuring the nuts, and cuts the roots. Men following behind the plough with pitchforks shake the nuts free from the soil and pile them in windrows. Other labourers follow and stack them around poles 7 ft. high, which are set at convenient places in the field. Care is taken to see that the vines do not come in contact with the soil, and the nuts are placed on the outside of the stacks. After the stack has been completed, it is carefully covered with straw or grass, as a roofing to keep off the water during rainy weather. After curing in these stacks for a period of twenty days or more, the peanuts are ready to be picked. This work is usually performed by women and children, who are paid so much per bushel. It is slow and tedious work, and one of the greatest expenses of the peanut grower. After the peanuts are picked, they should be cleaned before being sacked, as they will command a better price. Most of the work of cleaning, of course, is done at the factory, which is proper, because of the facilities now available for the work. The peanuts, as a rule, are put in bags, which hold about 4 bushels, or 100 lb. Many attempts have been made to devise a machine which would pick peanuts, but most of those on the market at the present time cannot be regarded as altogether satisfactory, and it is likely a large part of the hand labour now necessary in preparing peanuts for the market will have to be continued for some time to come, though inventive genius will probably find a way out of this difficulty in the course of time.

#### VARIETIES.

There are a number of varieties of peanuts, which are cultivated quite extensively. The Virginia "bunch" and "running" are two of the most popular and widely known in the trade. Tennessee red and white are also quite extensively cultivated. The African variety is grown in North Carolina, and the Spanish in Louisiana. These are among the most satisfactory varieties cultivated at the present time.

#### YIELD.

The statistics of peanut production in the United States show some rather surprising figures so far as yield is concerned. The very low average yield obtained at the present time indicates that there is good reason for seeking improvement in the methods of cultivation and fertilisation of this important crop. Seed selection, as already mentioned, would undoubtedly have a great influence on increasing the yield; but, above all, it seems advisable at this time to again emphasise the importance of using liberal amounts of well-balanced fertilisers for this crop. If greater attention were given to the enrichment of the soil, which, as already pointed out, is not well supplied with available plant food, the present yield could undoubtedly be doubled, and in many instances trebled. It seems surprising that more



attention has not been given to this important subject, since anyone may now obtain a fair understanding of the best methods to follow to insure the proper maintenance and nutrition of a given crop. The evidence at hand all goes to prove that liberal fertilisation will prove profitable. While small amounts of nitrogen may be necessary, potash, lime, and phosphoric acid should constitute the "trinity" of the peanut-grower.

#### CULTIVATION OF THE PEANUT.

Too much prominence cannot be given to the cultivation of the peanut. There is money in it. We have in Queensland a good market for the nuts for oil-producing purposes. They are also saleable in the Southern States for a like purpose, and also for confectioneries. Oversea, a steady market is to be found at remunerative prices. All things considered, a farmer with suitable land—a light, sandy, rich loam—cannot do better than devote a few acres to this crop.

We have just received the following article on the subject of peanuts from Mr. Henry A. Tardent, whose experience in various cultures is such as to entitle his opinions to serious consideration. He lately read a most interesting paper entitled

#### "A CHAT ABOUT A NEW SPORT FOR AUSTRALIA AND PEANUTS,"

before the Wynnum Literary and Debating Society, the first portion of which we omit, as we are more interested in his account of the peanut industry, in which he has proved the great value of the crop, the ease with which it is produced and harvested, and its ultimate financial results. The illustrations of the operations in peanut culture in the United States bear out all that Mr. Tardent describes, and, as "the proof of the pudding is in the eating," the photographs of one of Mr. Tardent's plants and of the single nuts are proof positive of what can be achieved by any farmer who has the proper soil suitable to the crop.

Mr. Tardent writes:—

"Another crop seldom seen in gardens hereabout, comes to us from Brazil, and is known to botanists under the name of *Arachis hypogea*. The French call it by the appropriate name of 'Pistache de Terre'; the Germans by that of 'Erdeichel,' or earth acorn. Here it is variously known as Chinanut, Monkey-nut, Peanut, or Earth-nut—all names as erroneous as they are funny. The peanut is not a nut at all. It is a bean, with all the characteristics of the Leguminosæ family to which it belongs; but it is endowed with a peculiarity seldom met with in other plants. Instead of producing and ripening its fruits in the open, it buries and ripens them in the ground, away from both air and sunshine. The pistils of the yellow flowers extend into a kind of thread, which penetrates for from 3 to 4 in. into the soil. The fruit forms at the end of that thread first in the shape of a fluffy pod, which seems to act not only as a protection but also as a store of material for the twin kernels which are usually found in each pod. It is certainly one of the most curious plants in existence.

"The cultivation of the peanut is comparatively easy. Sow in deeply and well worked ground, in rows 3 ft. apart, the plants being about 15 in. apart in the rows for small varieties, and fully 2 ft. apart for the larger variety, of which I shall speak later on. Drop one pod (usually two kernels) for each plant. This will require about 2 bushels of seed to the acre of ordinary variety, and fully double that amount of the larger varieties.

"Keep the land free from weeds and well pulverised until the plants, which extend spider-like, in every direction, are beginning to cover the ground, when they should on no account be disturbed. Peanuts can be sown at any time in the Spring, after danger from frost is over, up till about Christmas. For South Queensland I prefer November and beginning of December, which allows of the harvesting being done five or six months later in April and May,





*Plate XXXVII.*



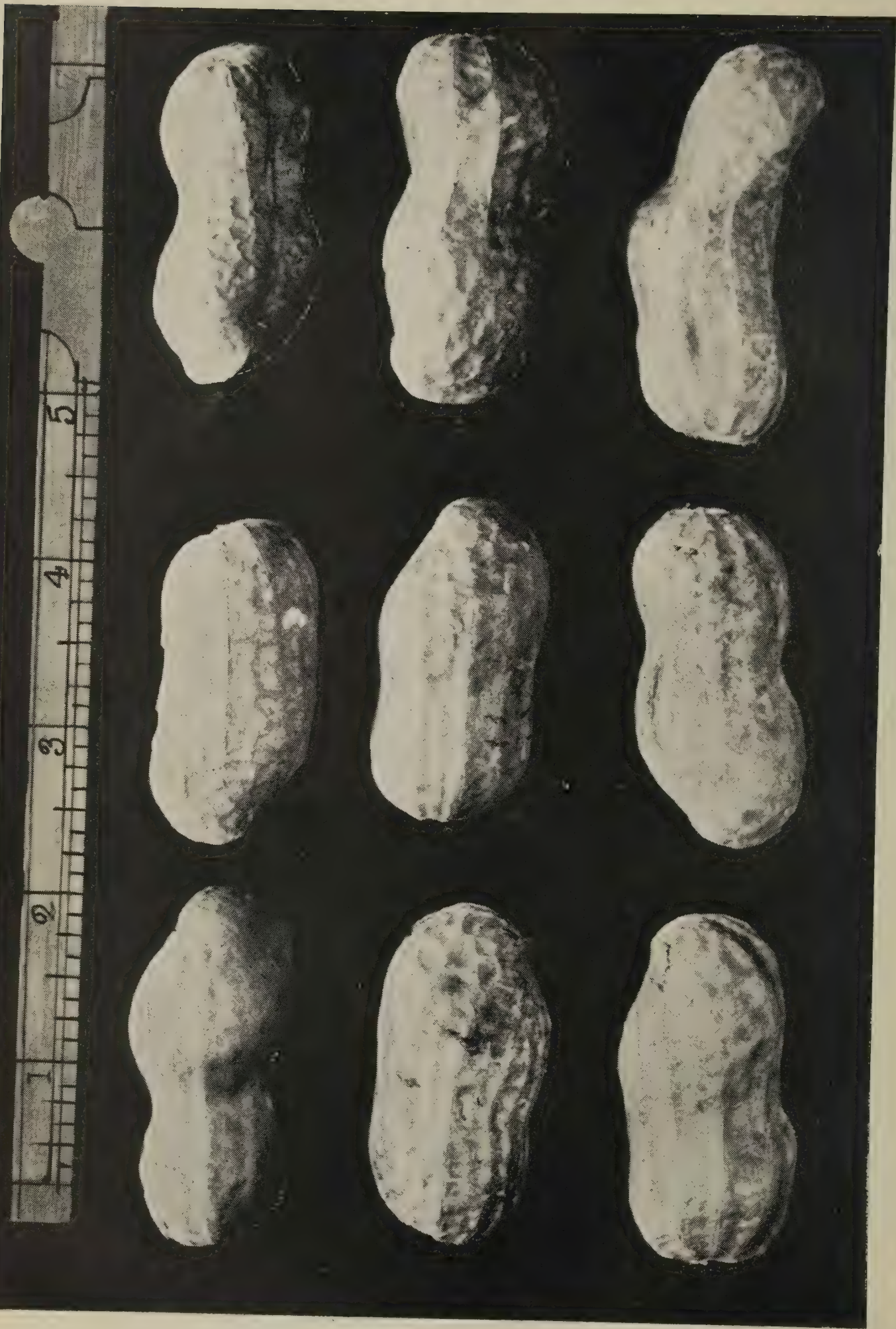
SINGLE STOOL OF GIANT PEANUTS.  
Grown by Mr. H. A. Tardent, Wynnum.



270



Plate XL



GIANT PEANUTS—NATURAL SIZE.



thus allowing you to escape the only danger of losing your crop—namely, the propensity of the kernels to germinate before being harvested, if they happen to get ripe during the hot, moist weather. On well-drained land the plant will stand with impunity any amount of wet weather, and it resists drought admirably, being one of the hardiest of all cultivated plants.

“The peanut is ready for harvesting when the vines begin to show signs of fatigue. In a garden the harvesting is easily done by means of a fork with which you lift the plants, shake off the dust and dirt, and turn them upside down. In a large field, use a plough from which the mould-board has been taken off and replaced by a horizontal knife cutting the ground *under* the nuts. Men follow with forks, shaking the plants and heaping them in wind-rows. They are then stacked around poles 7 ft. high, care being taken that the vines do not touch the soil and that the nuts are turned outside the stack and exposed to both air and sunshine. Those stooks have to be topped with a straw, grass, or bulrush hat, or any other device capable of preventing the rain from penetrating into the stack. The plants must remain in that state for at least three or four weeks, that length of time being necessary for the complete formation of the oil or for what is known to peanut-growers as ‘curing.’ The nuts are then pulled off by hand, bagged, and stored in a dry, well-ventilated place until they are either consumed on the spot or sent to market. A bag usually holds about 4 bushels of nuts, or 100 lb. When freed from the nuts, the vines form an excellent, though somewhat coarse, fodder, to which all farm animals take kindly when the vines are chaffed and mixed with some other fodders.

“As to the peanut itself, it is the richest of all vegetable foods, and is greatly relished by man and most domestic animals. It is especially rich in fat, and produces a beautiful oil, second only to the product of the olive. Peanuts are also largely used in the manufacture of the finer soaps, and form an important part of the import of most European countries, especially of France.

“But, if I have dwelt at some length on the peanut, it is not so much on account of its commercial value, which is great, as I shall show later on, as because it is such an excellent esculent, relished with equal eagerness by both young and old. I, therefore, hope that the anticipation of such a delicious crop to come might induce some of my young Australian friends to devote a few hours every week to the invigorating and profitable sport of gardening. For there is no denying the fact that the peanuts are a dainty delicacy. When boiled in salt water, or, still better, baked in a somewhat cool oven, they have a fine hazel-nut taste, hardly surpassed by that of any other nut. They are specially good for growing children. Doctors not seldom recommend their use to consumptives and other people with weak chests.

“As stated above, there are several varieties of peanuts, but here, in Australia, I have seen only two—the ordinary little dwarf, mostly grown by Chinamen and retailed by most fruiterers, and the ‘Giant.’ The latter is the one (here illustrated), which we planted in our Wynnum garden. True, we had to pay a stiff price for the seeds—no less than 1s. 6d. *per pint*—to our friend Mr. Wood, the Brisbane seedsman in George street; but the results have justified our speculation in expensive seeds, for the latter have developed into magnificent plants with deep tap roots and widely-spreading stems. They yielded at the average rate of about 100 good pods or nuts per plant. As fifty ‘Giants’ go to make 1 lb., this is equivalent to 2 lb. per plant, or considerably over 4 tons (8,960 lb.) to the acre. Of course, it would not be wise to always reckon on such yields, 2 tons being nearer the average crop of the average grower. Even at that rate, peanut-growing pays better than horse-racing (when you win at the latter game, which is seldom the case), whilst in gardening you are always on the winning side. At current market prices an acre of peanuts may run up fairly near to the three figures, whilst at the price we paid for our seeds you would have to reckon by hundreds.



"This being so, how is it that so few of our farmers and others go in for this crop? I really think that, if the peanut were better known, there would not be a single farm, station, school, villa, or cottage garden without its large or small plot of peanuts, which would supply both man and farm animals with that proportion of healthy vegetable fat which should never be wanting from a healthy and well-balanced diet."

---

### LAND EROSION.

Those who, in this State, are cultivating hilly land, cannot fail to have observed that during heavy rains quantities of soil are worked down from the cultivated land to the level country below. Especially does this erosion occur on ridgy scrub lands when once the stumps have been removed and the land has been cultivated; and the best remedy is to sow the land down with artificial grasses. This has been found necessary on some of the sugar lands in the Blackall Range.

Practically all hilly and rolling land is subject to erosion if the climate be a humid one. In such a climate rain-storms are frequently of long duration, while the thunder-storms are often of great severity, an immense amount of water falling in a short time. Sloping land is eroded before the owners know it, if they have not taken precautions against the erosion by leaving on the land its natural cover of trees or grass.

More than one nation of the old world has found its mountain tops rendered worthless by erosion. A notable case is that of the Jura Mountains, in France. There was a time when the tops of those mountains produced grass in such abundance that cattle, sheep, and goats were pastured on them in great numbers. But in course of time the private owners of the forests cut off the wood. Then followed erosion and the practical ruining of the grazing lands. The damage was done before the Government or the people awoke to the situation. The very rocks were washed bare of the soil that had been collecting for ten thousands of years. It was found that private enterprise could not be depended on to repair the damage, and the Government undertook the task. Soil had to be carried to the tops of the mountains. To prevent this new soil from being washed away before the roots of the trees could bind it together, small dams of stone had to be built supporting the soil. Then evergreens were planted. The work has been going on a quarter of a century or more, and it is expected to continue for more than a century from this time, so great is the task of bringing back the land to a condition in which erosion will not be possible. The measures taken to prevent a repetition of the trouble point a lesson as to how erosion of such soil may be prevented.

---

### WASHINGTON WHITEWASH.

This is an excellent wash for house-roofs or elsewhere. If properly made it will neither wash off nor rub off, and has the appearance of paint. It is so named from the fact that the "White House" at Washington, the official residence of the President of the United States, is coated with it. The formula is as follows:—Slake a bushel of quicklime in a barrel, covering with a bag while the lime is working; melt 1 lb. of common glue to a thin size; make 1½ lb. of ground rice into a thin paste with boiling water; mix up 1 lb. whiting as you would mustard. When the lime is quite slaked, add the glue, whiting, and rice-paste and a half-peck of common salt. Mix well and let stand for forty-eight hours, keeping covered. Thin down to consistency of ordinary whatewash, and apply hot.—"Journal of Agriculture," South Australia.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF APRIL, 1909.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Lubra ...	Jersey-Ayrshire	5 April, 1909	722	4.3	34.75	
2	College Lass	Ayrshire ...	31 Jan. "	872	3.5	33.82	
3	Nellie II. ...	Shorthorn ...	25 Feb. "	735	4.1	33.70	
4	Butter ...	" ...	20 Feb. "	815	3.6	32.60	
5	Glen ...	Grade Shorthorn	29 Jan. "	718	3.8	30.39	
6	Whitefoot ...	Holstein-Devon	20 Oct. 1908	613	4.0	27.26	
7	Laura ...	Ayrshire ...	16 Nov. "	671	3.6	26.84	
8	Linda ...	" ...	11 April, 1909	733	3.3	26.71	
9	Rosalie ...	" ...	10 Feb. "	684	3.5	26.54	
10	Honeycombe	Shorthorn ...	11 April "	581	4.0	25.96	
11	Bangle ...	" ...	23 Feb. "	564	4.1	25.87	
12	Blackbird ...	Grade Holstein ..	4 Feb. "	600	3.7	24.70	
13	Maud II. ...	Shorthorn ...	16 Jan. "	547	4.0	24.53	
14	Lady Ring	Guernsey ...	26 Jan. "	450	4.8	24.34	
15	Rennet ...	Holstein ...	19 Mar. "	589	3.7	24.24	
16	Dot ...	Shorthorn ...	12 Nov., 1908	625	3.4	23.51	
17	Daisy ...	Holstein ...	24 Oct. "	664	3.2	23.42	
18	Comet ...	" ...	22 Nov. "	565	3.7	23.25	
19	Dewdrop ...	" ...	11 Nov. "	573	3.5	22.23	
20	Dora ...	Shorthorn ...	18 Nov. "	563	3.5	21.84	
21	Graceful ...	Grade Shorthorn	10 Dec. "	420	4.5	21.24	
22	Gem ...	" "	13 Dec. "	450	4.2	21.17	
23	Beauty ...	Ayrshire ...	11 April, 1909	554	3.4	20.85	
24	Nancy ..	Grade Shorthorn	7 May, 1908	434	4.2	20.41	
25	Careless ...	Jersey ...	7 Dec. "	480	3.8	20.32	
26	Ethel ...	Grade Holstein...	3 Sept. "	508	3.6	20.32	
27	Len ...	Ayrshire...	6 May "	480	3.7	19.76	
28	No. 112 ...	Grade Guernsey	24 Nov. "	390	4.5	19.72	
29	Poppy ...	" "	10 Jan., 1909	510	3.3	18.59	
30	Orange ...	" "	23 Oct., 1908	300	5.2	17.70	
31	Nestor ...	Grade Shorthorn	4 Mar. 1909	476	3.3	17.34	
32	Lowla ...	Ayrshire ...	8 Dec. 1908	491	3.2	17.31	
33	Donah ...	Holstein ...	13 Oct. "	472	3.3	17.20	

DAILY FEEDING RATIONS FOR MILCH COWS.

The following rations for milch cows (given in an English contemporary) are calculated per 10 cwt. and not per 1,000 lb. live weight, as it is probable that 10 cwt. is about the average live weight of good milch cows in the North of England. For cows of a greater or less weight than 10 cwt. the feeding rations should be increased or decreased in direct proportion to their weights, provided the quantity of milk given is also greater or less in the same proportion :—

No. 1.—Ration for cows giving 18½ lb. of milk (roughly 1⅝ gallons) per day. Quantities for cows 9 cwt. live weight and giving 16½ lb. of milk daily are given within brackets.

39 lb. swedes or 52 lb. yellow turnips (35 lb. or 47 lb.)

19 lb. oat straw (17 lb.)

4¾ lb. decorticated cotton cake (4¼ lb.)

Roughly speaking, 1 lb. less of decorticated cotton cake might be given if the yield is 12½ lb. of milk daily instead of 18½ lb. daily.



No. 2.—Ration for cows giving  $30\frac{1}{2}$  lb. of milk (roughly 3 gallons) per day. Quantities for cows 9 cwt. live weight and giving  $27\frac{1}{2}$  lb. of milk daily are given within brackets.

$46\frac{1}{2}$  lb. swedes or 62 lb. yellow turnips (42 lb. or 56 lb.)

19 lb. oat straw (17 lb.)

$6\frac{2}{3}$  lb. decorticated cotton cake (6 lb.)

$4\frac{1}{2}$  lb. undecorticated cotton cake (4 lb.)

No. 3.—As for No. 2, with hay instead of oat straw. Quantities for cows 9 cwt. live weight and giving  $27\frac{1}{2}$  lb. of milk daily are given within brackets.

$46\frac{1}{2}$  lb. swedes or 62 lb. yellow turnips (42 lb. or 56 lb.)

19 lb. meadow hay (17 lb.)

5 lb. decorticated cotton cake ( $4\frac{1}{2}$  lb.)

$3\frac{3}{5}$  lb. Indian cotton cake ( $3\frac{1}{4}$  lb.)

Heavy milkers, giving about 4 gallons of milk daily, should have all the foods of the best quality possible, and could receive an addition like one of the following to that of Ration No. 3:—

2 lb. seeds hay, 2 lb. linseed cake, 1 lb. maize meal; or 2 lb. linseed cake,  $2\frac{1}{2}$  lb. maize meal.

Ration No. 1 might also have been substituted for oat straw, and, if so, the decorticated cotton cake should be reduced by about 2 lb. daily. This, however, is not quite an exact equivalent.

Any of these rations can have the roots considerably reduced by using a substitute for roots, as indicated at the beginning of this section.

Cows giving reduced quantities of milk as the lactation period progresses should have the concentrated food given to them reduced, but cows that are heavy milkers, and have become reduced in condition, owing to their heavy milk yields, must not have the food reduced too quickly, to allow them to regain condition before coming to the next calving.

When cows are to be fattened off at the close of their milking periods, the ration should not be reduced as indicated above, but should have the ration gradually altered to that suitable for fattening animals as the flow of milk decreases.

Cows of 10 cwt. live weight, dried off previous to calving, would probably do well with either of the following quantities:—

Quantities for cows of 9 cwt. live weight are given within brackets.

No. 1.—39 lb. swedes or 52 lb. yellow turnips (35 lb. or 47 lb.)

19 lb. oat straw (17 lb.)

$2\frac{3}{4}$  lb. maize meal ( $2\frac{1}{2}$  lb.)

$2\frac{1}{2}$  lb. decorticated cotton cake ( $2\frac{1}{4}$  lb.)

No. 2.—39 lb. swedes or 52 lb. yellow turnips (35 lb. or 47 lb.)

19 lb. meadow hay (17 lb.)

$2\frac{1}{4}$  lb. maize meal (2 lb.)

$\frac{2}{7}$  lb. decorticated cotton cake ( $\frac{1}{4}$  lb.)

Additional water should be given to that contained in any of the foregoing rations, so that in all cases the cows should have access to water.

The Guernsey, as follows:—

			Lb. Milk.		Lb. Butter Fat.
Two-year-old class	...	...	5,000	...	200
Three-year-old class	...	...	6,000	...	240
Four-year-old class	...	...	7,000	...	280
Mature class	...	...	8,000	...	320

The Holstein-Friesian, as follows:—

			Lb. Milk.		Lb. Butter Fat.
Two-year-old class	...	...	7,500	...	255
Three-year-old class	...	...	8,500	...	289
Four-year-old class	...	...	9,500	...	323
Mature class	...	...	10,500	...	357

And, lastly, the Jersey, as follows:—

				Lb. Milk.		Lb. Butter Fat.
Two-year-old class	...	...	...	5,500	...	218
Three-year-old class	...	...	...	6,500	...	257
Four-year-old class	...	...	...	7,500	...	297
Mature class	...	...	...	8,500	...	337

Some of the yields are given, from which it may be inferred that a good start has been made with some of the best milking cows in the country. The Ayrshire, for instance, that gives 11,357 lb. of milk and 409·95 lb. of butter fat in the year, equivalent to an average of 3·6 per cent., is worth having. Her highest yield during any month was 1,302 in November. Still better, however, was the performance of Daisy Queen, which gave 13,158·3 lb. of milk and 485·39 lb. of butter fat, her highest monthly yield being 1,543 lb. in June. Then, again, Daisy of Carlheim gave 12,297 lb. of milk in the year and 3·15 per cent. fat. Other Ayrshire yields include 10,202 lb. of milk, 11,222 lb. of milk, &c.

### THE VALUE OF GRADING BUTTER.

The prominence gained by the Queensland butter in the dairy section at the Royal Show has (says the "S. M. Herald") aroused considerable comment amongst dairymen and others interested in the industry.

The success, it is urged by those competent to express an opinion, is due principally to the system of grading and proper supervision brought about by the Queensland Government in place of the happy-go-lucky methods which have so far prevailed in this State. All the prizes in the section were not gained by the northern State, but important awards were appropriated from what are considered our leading factories. The success of the Warwick Dairy and Butter Company in the class provided for butter salted and manufactured ready for export and that of the Dalby Butter Factory in the unsalted class are awards which are largely competed for, and around which a great deal of interest centres.

In view of this fact an expression of opinion was sought from a well-known gentleman connected with the industry. He stated that the result of the competition had not come as a surprise to him. The northern butter was of exceptionally good quality throughout, and its success was without doubt due entirely to the operation of the excellent Dairy Act in force in Queensland, which provided not only for proper grading, but also instruction and assistance generally. To his mind there was in some quarters an unaccountable spirit of misunderstanding prevailing in this State regarding dairy and factory requirements, and until those in the industry realised how they were lagging behind their butter would not meet with any measure of success. The result of the judging this year was one of the biggest object lessons yet placed before us, and we should certainly profit by it. What was required was a new dairying Act, covering compulsory grading and instruction to farmers and factory managers.

"First and foremost," continued the gentleman interviewed, "you must make the factory manager an educational factor in his own district. He is the man whom the supplier looks to for sound practical guidance in the delivery of the raw product in good condition. This may mean apparent hardship to the producer, who should not be allowed to pool his cream, and might mean cartage over bad roads; but, at the same time, the keynote of the situation is quality, and no manager can get near this if the cream or milk supplied is invaded with dirt or false organisms. Hence, I say, it is absolutely necessary that the manager should have a knowledge of fermented processes, their origin and control. This means education of a technical nature,



involving an elementary knowledge of bacteriology and a familiarity of the principles of testing, which can only be acquired as the result of laboratory training. These essentials appear to be lacking in this State, hence the necessity for agriculture to get to the bedrock of the cause of the failure of price and quality. The aim of the department should be to provide a thoroughly sound technical training in the manufacture of butter and cheese, combined with an absolute knowledge of how to educate the farmer in the delivery of the raw product.

"Moreover, factory managers should be required to pass an examination, and hold a certificate of competency. This in itself would be an assurance to a board of directors that they were employing a man who could assist their shareholders. This has already been accomplished in New Zealand, Victoria, and recently Queensland, where managers are given ample opportunities at the various colleges and the assistance of travelling experts to bring up the grade of butter. This work must be done before a marked improvement can be effected by grading. And then, again, the graders at the port of shipment should be specially selected men, whose educational training and knowledge of grading have been acquired in the factories themselves, and who are known to possess a good palate and keen judgment; because the most important feature of the whole work is that where faults are discovered at the port of shipment, the factory manager in question should be promptly informed. Should the communication fail to produce an improvement, a competent man should be despatched to the factory to investigate local conditions, and ascertain the cause of the trouble, and stay there until an improvement has been effected. In this way the supplier would reap the benefit, and I venture to say that with this system continually in operation all weak factories would have the standard of their products raised, and we would get rid of third and fourth qualities.

"A great deal has yet to be done in educating the farmer as to the necessity for sanitary surroundings, in the raising of the grade of his cattle, and in encouraging a system of stall-feeding during periods of scarcity, such as mid-winter and mid-summer. In this regard, too, the advantages of the conservation of fodder, particularly maize ensilage, will have to be impressed upon dairymen; and when farmers realise this they will materially increase their income, and the quality of the butter will be immeasurably better.

"The men sent out to educate managers and farmers should be in no wise called inspectors, but rather instructors. Their concern should be purely with the man who milks the cow, and their advice and assistance should be welcome at every farm. Then, and only then, will our butter maintain a high standard of quality, and be in a position to successfully compete with samples from those States where the industry is carried on on thoroughly progressive lines."

---

### DEHORNING COWS.

Experiments were recently made at one of the American agricultural stations with a view of ascertaining whether the operation of dehorning dairy cows was painful. In several cases the per cent. of butter fat had been noted at each milking for a few days before and after dehorning, and from these a fair estimate was arrived at of the effect of dehorning on the dairy cow.

At one experiment station a record of ten cows was kept. Each cow was tested two milkings before dehorning and four milkings after dehorning. In every case but one, the milk tested much lower at the milking immediately after dehorning. The test gradually increased, until it was much higher than it had been in the milkings previous to dehornings, and the actual amount of butter fat produced by the cows was as much or more than it would have been had the cows not been dehorned.



At another time, at the same station, 12 cows were dehorned, with a loss of 5 per cent. in the total yield of milk in six days after dehorning and a gain of 4 per cent. in the total amount of fat produced in the same time. A record of the weight of the cows before and after showed practically no loss due to the operations. At another station 14 cows were dehorned. Most of them fell off in their milk slightly, but gained in per cent. of butter fat, and at the fourth milking all were back to their normal flow. The 14 cows made about 1 lb. less in the two days following dehorning than they had made in the two previous days.

From these reports it appears that there is a very small percentage of loss in the total amount of the milk produced, and very little, if any, loss in the total fat produced, in the first few milkings following dehorning. In the majority of recorded trials the cows came back to their natural flow of milk in less than a week, often in two days. Judging from this the pain suffered by the cow must be slight.—“Australian Gardener.”

---

### A CURIOUS COW.

Dr. James Anderson, in his “Recreations in Agriculture,” mentions a very curious cow (says the “Live Stock Journal”). “I know one,” he says, “which yielded abundance of milk, but from which no butter could ever be obtained by any process that could be devised, and it is not a little remarkable that that cow had been kept for several years by one person without its ever being discovered or even suspected that her milk had that quality. The milk had always been mixed with that of others, as is usual in large dairies, and it probably would never have been discovered at all had she not been sold to a person who kept no more than one cow.”

[It would be interesting to know if any such phenomenal milk has been ever produced by an Australian cow.—Ed. “Q.A.J.”]

---

### STRAW BUTTER BOXES.

An English journal credits Queensland with the formation of a company with a capital of £50,000, for the manufacture of straw butter boxes. It also states that butter boxes have hitherto been made of pine, but the drain upon this timber owing to the heavy exports has been so severe that the wood is rapidly going up in price. One can understand this on noting that in one month (March, 1908) over 50,000 boxes of butter arrived from Queensland in this country; 1,250 tons, worth £140,000. The new box is made of barley straw. In its manufacture a mixture of kaolin and straw is used. It can be produced and sold for 1s. At present 3,000,000 boxes are used in Australia annually, costing £200,000. The new boxes will save the dairy industry about £40,000 a year. The material for manufacturing the box can be grown in the same paddock that supports the cow. The new type of box is in every respect equal to the old. It weighs about 10½ lb., is damp-proof, and odourless.

[Straw butter boxes have never been manufactured in Queensland. They were made in Victoria, and, we understand, were compound of straw laid horizontally, and mixed with kaolin. On a trial of these boxes being made to ascertain if they would bear the strain of a load of a layer of twenty boxes, it was found that they collapsed under a load of eleven boxes. This led to an improvement in that the straw was placed perpendicularly. We have not heard how this different position of the straw has increased the resistant power of the sides of the boxes.—Ed. “Q.A.J.”]



## Poultry.

### PREPARING POULTRY FOR SHOW.

There are two chief points in preparing a bird for the showroom—first, quietness ; and second, cleanliness.

By quietness is meant birds that are easily handled, and will not be scared nearly to death when in a coop. The fancier can train his birds for the show just as a horse is trained for a race. Starting, say, a month before the show, the birds that are to be exhibited should be handled as much as possible, so as to get them good and tame. If the show specimens are placed in a coop at night, and fed in the morning before letting them out, they will soon become used to the coop. While shut up, they should be taken out of the coop and handled, just as a judge would handle them at a show. A short cane should be kept handy, and the bird taught to pose when touched with it. If this treatment is kept up, your birds will show up far better than your neighbours' birds that have not had such good preparation.

While your birds are showing themselves off to the best advantage, your friends' untrained birds are huddled up in the far end of the coop, and are afraid to stand up for inspection. Thus it will be seen that much is to be gained by training your birds for the show, for, even if your birds are not quite as good as the other fellow's, your specimens will show up far better than the other party's scared-to-death birds. Anyone who has ever visited a show knows that the above is perfectly true, and, while some birds were looking their best, some others would be found huddled up in the back end of the coop.

In the second place, your birds must be clean from beak to toe, and most birds are the better for a good washing. Of course, if your birds are not white, and the plumage looks good and clean, then it is not advisable to wash them unless you understand the job from start to finish, for the writer remembers the mess he made of the first birds he attempted to wash. But most all white birds are better for a thorough washing. To successfully wash a bird, you will want three tubs. In tub No. 1 place clear warm water ; in the second, warm water with a quantity of soap dissolved in it and made into suds, and tub No. 3, containing warm water with a little bluing added. An assistant is necessary, for one person cannot manage alone very well. Now bring in your birds (you should borrow the kitchen for the job), and provide a light coop for them. Catch a bird, and, while your assistant holds it in the water of tub No. 1, you should thoroughly wet all the feathers. Be sure and have all the plumage well soaked. Now, squeeze out as much water as you can, and then place in tub No. 2. And now the real work commences. Take a bunch of feathers in one hand, and thoroughly wash them with the other. Don't be afraid of hurting the feathers, for a wet feather will stand a lot of rubbing. A tooth-brush should be used to clean the legs and feet, being sure to get all the dirt out of the cracks and corners. The water should be pressed out of the feathers as much as possible, and the bird is now put into No. 1 tub again, and all the soapy water rinsed out of the plumage. Now place your bird in the third tub, and be sure and get the blue-water thoroughly into the feathers. Press out as nearly dry as possible, and give the bird a toss up in the air to get the feathers loosened up, and then place in the coop to dry. Be sure you get the head and feet perfectly clean. Before sending or taking your birds to the show, rub up their legs with a soft cloth to which a little vaseline has been applied. The comb and the wattles should be treated in the same manner. If you don't wash the plumage, be sure and clean head and feet, for a bird with dirty legs and feet is not a nice specimen for a judge to handle, and he will give preference to the clean bird every time.



## BUYING POULTRY.

The poultry industry owes much to the fancier, for had the poultry farmer no source from which to acquire new blood he would soon find his profits diminishing.

The fancier aims to keep the breed or breeds in which he is interested up to the highest standard of perfection, and little does the general public realise the time and expense which this entails. No one will ever succeed as a breeder of prize poultry who does not possess, in addition to a genuine love for his feathered pets, an unlimited amount of patience and perseverance. One year his birds carry everything before them, but next season the other man is successful, and appropriates all the honours.

Even with the most prominent and successful exhibitor, the number of young stock it is necessary to hatch and rear, from which to select a team that will do him justice in the show pen, incurs an expense which the casual visitor at a poultry show would hardly credit. If there is an average of five fowls out of every hundred reared, possessed of sufficient merit to do their owner credit in the show pen, that owner can consider himself fortunate indeed, whilst in some breeds, such as silver or gold-laced Wyandottes, owing to the difficulty in breeding well laced plumage, the average is much lower.

Small wonder is it, therefore, that the fancier asks a price for his winners that the lay mind thinks extortionate, but when all expenses are taken into account, even if the breeder were to sell all his winning birds at these figures he would not make a profit. Breeders of the present day value their reputation so highly that they will not keep an inferior specimen, but kill all "culls" as soon as they are old enough for table purposes. Every season lots of people are very anxious to buy these "culls" at the price of table birds, but the fancier who desires to make or maintain a prominent place amongst the "fancy" steadfastly refuses to sell them alive, as nothing would more quickly lead to his undoing than to allow to be seen by the public a lot of "scalawags," which are declared by their owner to be bred direct from "So-and-So's" birds. Sooner than let this happen, would any leading breeder wring the neck of every bird not up to a reasonable standard and burn them.

Thus it is that no rubbish ever leaves a reliable breeder's yard, and so the public are protected from having inferior poultry foisted upon them. When a good quality of poultry is required, let the buyer patronise a reputable fancier and be prepared to pay a fair price for a good article, and both parties to the deal will be satisfied.

---

---

DESTROYING CATERPILLARS.

A novel method of dealing with the caterpillar pest has been described to a representative of the "North Otago Times." In the early days of the North Otago district caterpillars were a greater scourge than they are in these days of the small bird pest, and a farmer in the district determined to try a method he had seen in operation in South Australia. He noticed that for about a chain wide and several chains long myriads of caterpillars had settled down on his crop, and were destroying the heads of grain. He took the rope reins from a team, and he and his ploughman, stretching these across the affected part of the crops, at about 6 in. below the tops of the heads, marched along with the rope taut. The grain bent down as the rope passed along, and when freed of the pressure, sprang back with a jerk, throwing every caterpillar to the ground. Natural instinct warned the insects of danger, and they swarmed out of the crop and on to the road, where an opportune "north-wester" shrivelled them up.



## The Horse.

### GRIPES.

Colic is the exhibition of pain in the interior of the abdomen. It is a symptom of many diseases, such as indigestion, worms, rupture, obstruction, inflammation, &c.

In treating a horse for gripes the person prescribing should try and first ascertain the cause. The great danger with horses subject to colic is that they cannot vomit, and other means of relief must be sought for.

The symptoms are: Disinclination to work, uneasiness, pawing with fore feet, arching the back and making attempts to lie down. As the trouble gets worse, the animal makes efforts to cow-kick at his belly, the pulse is frequent, breathing difficult at times, and the body more or less perspiring. The best symptom is when the pain is intermittent. Unfavourable symptoms are high temperature, cold and wet perspiration, and a haggard expression of the face. If the horse stales easily, it is a very hopeful sign.

The treatment of colic is various. The majority of cases would recover if left alone. Purging, turpentine irritation, strong drenches, &c., increase the mischief. Linseed oil is good as a soothing and mild aperient. Chlorodyne and a quart of warm ale with a little spirits often work wonders.

Keep the horse quiet in his stall, with plenty of bedding under him, so that he may relieve himself by rolling. One or two enemases of warm water act well. A catheter should be passed if the urine is not voided. In serious cases expert treatment in regard to drug-giving should be at once obtained.

---

### RINGWORM ON HORSES.

Last month we gave a remedy for ringworm on horses, and also mentioned the cause of the affection. A writer in the "Farmer and Stockbreeder," London, says that ringworm spores reside in old woodwork, both indoors and out, and that he knows fenced yards where it just as surely occurs as the stock are put in them. The occupier pays annually as much for attendance and veterinary dressings as would suffice to fence one section each year, and eradicate it, but, like many others, he only half believes in the sources of infection. In mossy and in peaty soils the spores may remain and infect animals lying on them, but a frequently-overlooked purveyor of ringworm of late years is peat-moss litter, which, when moist with urine and warmed by slight fermentation, is a perfect generating station. If this is spread on land it ensures the reproduction of ringworm. Stockholm tar, made warm and laid on with a brush, is the safest and most lasting for trees and fences. Inside of buildings the stock can be dressed with 1 lb. of chlorinated lime, shaken daily, with 2 gallons of water, in a stone bottle, and used after the third day or any subsequent date, as it will keep until the bung gets eaten away. A penetrating and effective dressing for cattle is made of 1 part of creosote and 7 parts of fish oil.

---

## Horticulture

### FLOWER GARDENING, No. 17.

#### PLANTS SUITABLE FOR IN AND OUT DOOR CULTURE.

By THE EDITOR.

##### ORCHIDS.

For the successful cultivation of the larger part of this peculiar and delightful race of plants, an atmosphere, either naturally humid, or rendered so artificially, is absolutely essential. The most beautiful of our Queensland Orchids are to be found in the warm, humid, tropical scrubs of North Queensland, but many desirable kinds are obtainable in the riverine and mountain scrubs of the Southern coast, and, notably, in those of the fairly humid Blackall Range.

It was, at one time, considered that Orchids could only be successfully cultivated in glass conservatories, but it has been conclusively proved that, from the want of sufficient ventilation, probably, such depositories are not well suited for them. One main point in the treatment of Orchids, formerly not given due attention to, was a sufficiency of light. It is a mistake to think that these plants live in the dark in their native localities, and that a situation where no sun can reach them is the one best adapted to them. They live, it is true, in the shade cast by the foliage of the trees on which they are suspended or beneath which they grow; but that foliage is not altogether, and at all times, impervious to the rays of the sun; and, moreover, when the trees lose their leaves, as many do, during the cold months, the plants must needs be subject to a very considerable exposure to full sunshine. This would have the effect of ripening their wood, and thus causing them to bloom. It becomes a question, then, if there be not those which it would be desirable to remove from the shade house and subject to the full influence of the sun during, at least, some portion of the year. Orchids are either terrestrial or epiphytal, the former growing in the soil, the latter attached to trees or rocks, hence the name of air plants, which has been given them, their chief sustenance being derived from the atmosphere. Most of the terrestrial species are natives of temperate climates, while the majority of the epiphytal species are natives of tropical zones. Some of these require a very high temperature, while others that are found on mountains, or outside the tropics, thrive in a lower temperature, so that, from a cultural point of view, houses of different temperatures must be provided.

In India, some Orchids are grown in what are called "Betel Houses." The Betel house, in which the Betel plant has been cultivated from time immemorial, is practically our Queensland bush-house, and as Orchids are lovers of light and air, ventilation is consequently necessary, and therefore, our open bush-houses suit many kinds admirably, provided the plants are not placed in draughty positions. Even the varieties which are shade-loving, require light, though not direct sunshine, for they will not thrive in dark corners. All like a moist atmosphere when in a growing state, and, as their life is sustained by the moisture they obtain from the air, the surroundings

---

##### ERRATUM.

In my notice of the *Durantae*, it was stated that *Duranta Ellisii* has white flowers. This is an obvious error, the flowers of this variety being dark blue. *D. plumeri*, var. 1 *Alba*, is white flowered.

There is a pretty blue flowering *Duranta* in the Executive Garden, Brisbane, which has variegated foliage—green and white.



should always be kept damp when the plants are in full vigour of growth. I have grown some beautiful Orchids from New Guinea with no other shade than that afforded by peach trees, which, as we know, are deciduous, and hence leafless for several months of the year.

These considerations lead us to the matter of

#### ORCHID HOUSES.

These are classed according to the climate of the country from which the Orchids emanate, and also according to the temperature in their native habitat. Thus, we have

The East India House, for plants from low elevations in India and other parts of the tropics, in which the temperature should range from 70 to 75 deg. Fahr. by day, and from 65 to 70 deg. by night.

The Brazilian House, which will accommodate all the plants from the low regions of the Western Hemisphere, in which the temperature may be allowed to fall to 65 deg. by day, and to 60 deg. by night.

The Peruvian House will include the mountain plants from the Western, or, as it might be called by Australians, the Eastern World, and most of the natives of Australia, for which a temperature of 60 deg. by day, and 55 deg. by night will suffice.

Then there is the Cattleya House, the Intermediate House, and the Cool, or Odontoglossum House, with temperatures varying from 60 to 65 deg. by day, to from 50 to 60 deg. by night.

A large proportion of epiphytal Orchids prefer shade, but others, such as some of the *Lælias*, *Coryanthus*, and similar genera, thrive best when close to the glass, and love full exposure to the rays of the sun; therefore, a portion of the Orchid house should be entirely devoted to them, so that their requirements in that direction may be met.

The common practice in the culture of Orchids is to devote a house entirely to them, but not only is it more congenial to their nature to grow amongst other tropical plants, but a better effect may be thereby produced, for Orchids, when not in flower, are not particularly enticing. It is, therefore, advisable to introduce, at any rate, to the East Indian House, some of the tropical Tree and other Ferns, climbing Aroids, *Nepenthes*, and the smaller-growing Palms, which, standing above the Orchids, furnish a grateful shade, and, their stems being slender, they form no objectionable obstruction.

Most of the above I have taken the liberty of reproducing from the useful little book on Australian Gardening, by Mr. W. Adamson, and now repeat the following directions for propagating Orchids, given by Mr. B. S. Williams in "The Orchid Grower's Manual":—

Some are easily increased by dividing them into pieces, or by cutting the old pseudo-bulbs from the plants after the latter have done flowering. Such plants as *Dendrobium* are increased in this way. The best time for this is just as they begin to grow, or when they are at rest. They should be cut through with a sharp knife, between the pseudo-bulbs, being careful not to hurt the roots. Each piece should have some roots attached to it. They should be parted and potted, and receive no water until they begin to grow.

*Dendrobium nobile*, *D. Pieradii*, &c., are propagated—

1. By bending the old pseudo-bulb round the basket or pot in which they are growing.
2. By cutting old flowering bulbs away from the plant, laying them on damp moss, and, when they make roots, potting.

*D. aggregatum*, *D. densiflorum*, and similar plants are increased by dividing the roots.

*Aerides*; *Vanda*; *Angraecum*; *Saccolabium*; *Renanthera*—

1. Cut off the top of the plant, just below the first root.
2. Take young growth from the bottom of the plant.



*Epidendrum*; *Cymbidium*; *Cælogyne*; *Cattleya*; *Bletia*, and many others—

Divide into pieces with portions of the roots attached, and a young bulb on the pseudo-bulb.

Different modes of growing them are adopted, suited to the peculiar habit of each. Some thrive best fastened with moss upon the bough of a tree, or upon a log, some in open-work baskets of wire or wood, and some few in pots. The time for re-potting such as are grown in pots, is at the close of the period of rest, just as they begin to start into growth. Previous to potting it is laid down as indispensable that they receive no water for a few days. The mode of potting is very simple. Within the pot to be used, place a smaller one turned upside down. Between the two pots, put large lumps of broken brick and charcoal, and fill up to the rim with pieces smaller and smaller. Upon these spread out the roots of the plants, and cover them with small pieces of the same material. To keep the plant steady, insert a couple of stout sticks to tie it to.

When grown in suspended baskets, the baskets may be so designed as to be very pleasing ornaments themselves. The material with which the baskets are filled will be the same as that used in the pots.

To grow them on logs, they must be bound on with copper wire, protected first with moss or cocoa-nut fibre.

Another authority says:—In potting or basketing Orchids, care should be taken that the eyes of the plant are not covered. They are always at the base of the previous year's growth, and it is of vital importance that the potting material does not cover them. Fill the receptacle partly with broken crocks, cover this with some moss or similar material to prevent the compost from clogging the drainage; then add the compost, and see that the Orchid is potted firmly and staked so that it is fairly rigid. If any of the roots are dead or broken, it is better to sever them with a sharp knife. See that the roots are not bruised or broken in any way when potting, and above all do not over-pot. Orchids, as a rule, do better in small receptacles than in large ones. To a beginner this may be difficult to understand; but it is a fact worth remembering. Do not allow the compost to become wet or sour, or the plants will not thrive, and be attacked by disease.

#### THE ORCHID-GROWER'S START.

To become a successful Orchid-grower, demands far greater study and steady application than are required for general horticulture. The conditions under which Orchids thrive in their native habitats are so varied, that success can only be attained by those who make a serious study of those conditions, and strive to reproduce them under totally different climatic exigencies.

In commencing to get together a collection of Orchids, the beginner will do well to start with the varieties that find their native habitat in Queensland. The purple varieties from North Queensland are fairly common in Brisbane, yet how few people make them do well. I saw some quite recently on a friend's veranda post—upside down, tied loosely, and in such a position that they never got any moisture from dew or rain. Little wonder that they did not succeed with him. The two purple varieties referred to are *Dendrobium bigibbum* and *Dendrobium phalænopsis*. They are obtainable at Cooktown and other far Northern ports very cheaply, and if given an easterly aspect, with shelter from our westerly winds, they do remarkably well. They can be grown on Frangipanni or other trees, but do equally well on hardwood blocks, provided a little peat or moss is attached firmly to them with copper wire. In fixing on the plants, see that they are firmly tied, otherwise the young roots may be injured should the plants sway about. During the warm weather, when the plants are growing, they should be watered daily. After they have bloomed (which is in the autumn) water should be gradually withheld, and



during the winter, which is their resting season, very little water should be given—just sufficient, in fact, to prevent shrivelling. Another lovely purple Orchid from the far North is *Dendrobium superbiens*, but this is not so plentiful nor so cheap as the other varieties. *Dendrobium undulatum* is fairly plentiful about the Cairns district, and does splendidly around Brisbane outside. It has a robust habit, the stems or pseudo-bulbs attaining a height of 8 or 10 ft. The flowers, which vary a lot, are in colour of various shades of a beautiful golden brown, and, as the name indicates, are very much twisted and crinkled. This variety throws a fine spray of flowers, bearing up to 20 on a flower spike, and is an excellent variety for ladies' sprays. It should be given plenty of moisture and sunshine.

If grown in a shady bush-house, it does not flower freely. *Dendrobium canaliculatum*, so named on account of the canal-shaped leaf, has a pseudo-bulb not unlike an onion. It is fairly plentiful in the Mackay district, where it grows on the ti-trees—particularly on the sea-shore—exposed to the sun. It has a lovely flower, white with a prettily-marked purple and orange lip, and has a very sweet perfume. This should be given a sunny position also. *Dendrobium Kingianum* is another favourite Orchid with beginners. It is obtainable on most of the mountains near Brisbane, but more particularly on the Main Range. It grows on moss-covered rocks, and during the spring months its beautiful pale-pink, dark-pink, and light-purple flowers are a sight worth beholding. It likes a shady position, and grows well in a basket with good drainage and a little peat or moss over its roots. *Dendrobium delicatum* is a fine variety, having a habit something like *Kingianum*, though the flowers are larger and open out better. It has beautiful large sprays of creamy white flowers, and possesses a very fragrant perfume. It is one of the finest of Queensland Orchids, and is getting very scarce. It grows on the Main Range, near Toowoomba. It likes a shady position, and should be given similar treatment to *Kingianum*.

*Saxochilus cecilliae* is another little favourite with beginners. It has light-pink flowers, is very floriferous, and possesses a distinct and pleasant scent. It grows naturally on moss-covered rocks, but does equally well in cultivation on trees, or in pans containing plenty of broken crocks, with a layer of sphagnum or other moss over its roots. Writer sent home to England a clump of this variety, and though the flower is small it is much prized by the friend who received it.

All the foregoing are Epiphytes—i.e., plants which grow upon trees—but some of the terrestrial kinds are worth inclusion in any collection.

*Calanthe veratrifolia* has pretty snow-white flowers, and makes a nice display in summer. A case of this variety was sent to England some years ago, and arrived in full bloom. It was sent to a flower show on the Continent, and was awarded a silver medal by the judges as an exhibit of exceptional merit. *Phaius grandifolius* and *Phaius Bernaysii* also do well, and have much bolder flowers than the *Calanthe* named. They require a shady position, and, having fleshy roots like the *Calanthes*, should be grown in a compost of fibrous peat, sand, and light loam, with plenty of good drainage.

The foregoing varieties do not embrace all that are available in Queensland, but are sufficient for this article. Should the beginner wish to add a few of the imported kinds, it can be done at very little cost, as the varieties I shall name are hardy, with practically very little risk of loss. *Dendrobium nobile* is one of the greatest favourites, and it does well in an ordinary bush-house. During the warm weather, when in a growing state, plenty of moisture is required. After the growths have matured, withhold water, and give only sufficient to prevent shrivelling. The winter is the resting season, and, unless the plants get a decided rest to harden their growths or pseudo-bulbs, few, if any, flowers will be given in the spring. Small plants can be imported from about 2s. 6d. each upwards. A plant of *Nobile* recently



flowered in Brisbane with 502 blooms, a record that it is possible has not been exceeded in any part of the world. I mention this to show how suitable our climate is for some Orchids, provided the proper treatment is given them.

*Dendrobium Thrysiflorum* is another hardy variety. It is not deciduous, however, so does not relish the drying in spring that *Nobile* can. It must not be allowed to shrivel or lose its leaves, otherwise a certain amount of natural strength in the plant will be lost. Its lovely tresses of white and orange flowers makes it a good variety for showing. *Dendrobium densiflorum* and *Farmeri* are two other fine varieties of the evergreen habit, which do remarkably well here under ordinary bush-house conditions. They, too, have beautiful tresses of orange and white and yellow respectively, and, like *Thrysiflorum*, are fine show varieties. *Dendrobium wardianum* possesses a truly noble flower of great substance. It is a waxy white, tipped with amethyst purple. The throat is ochre yellow, with two dark sanguinous blotches at the base. Like *Nobile*, is another variety which does remarkably well here. *Cattleya labiata* also does remarkably well here. It is one of the grandest of all Orchids, and hails from Brazil. There are many shades of this beautiful Orchid, from a blush rose to a deep rosy purple. It flowers in sheaths of 4 or 5 flowers to a pseudo-bulb, each flower measuring up to 8 in. across when fully expanded. The throat is usually marked with yellow, and the lip from a light shade to a very dark purple, and some varieties have a beautifully fringed and wavy lip. *Cattleya Trianae* resembles the foregoing somewhat, likewise *Cattleya Mossiae*, and some splendid specimens are to be seen among local growers. There are quite a number of other popular sorts in the *Cattleya* section well worth the attention of beginners, but I must be brief, so I shall pass them on this occasion, but cannot omit *Cattleya Harrisoni*, which throws sheaths with several flowers varying in shade from lilac to dark magenta, with a yellow and well-shaped lip. It is another hardy inexpensive sort, which thrives and blooms well here.

The slipper Orchids, which are called *Cypripediums*, possess a form peculiar and interesting by reason of the extraordinary shape and structure of the flowers. The upper or dorsal sepal is usually large, and the brightest feature of the flower, while the lip or labellum takes the form of a slipper-shaped bag. This family of Orchids is terrestrial in habit, and possesses no pseudo-bulbs, the flower spike being produced from the centre of the leaves, which in many species are beautifully mottled. *Cypripediums* require a compost of fibrous peat, sand, and leaf mould, and a moist, shady position, and do not need the rest necessary with some of the species named. *Cypripedium*, *Barbatum*, *Insigne*, *Callosum*, *Exul*, *Lawrencianum*, *Spicerianum*, *Venustum*, and *Villosum* are all doing well in the local collections, so that fact, combined with their cheapness, warrants my recommending them as suitable for beginners. *Laelia anceps* is another fairly hardy Orchid that does splendidly when once established. It blooms in late autumn, when flowers are scarce. It comes from Mexico, and likes outside treatment. The flowers are variable, and are borne on tall spikes of 5 or 6 flowers of a rose colour, the lip being crimson purple, with yellow and red stripes.

There are, of course, hundreds of other Orchids which I could include in this article, but the foregoing is sufficient to enable beginners to get together a collection which will comprise many beautiful and hardy sorts that will well repay them for the little attention required in the way of watering and other attentions during their growing seasons.

Frequently one reads of fabulous prices being given for Orchids, and this more often leads the uninitiated to suppose that the extreme loveliness of the flowers borne by the plants purchased is the reason for the high value. In rare cases this may be so, but it is generally the rarity of the plant that commands the price, and it is possible a lover of flowers not versed in Orchids, if offered the choice of a 500-guinea plant or one sold usually for half a crown, might choose the latter as the more beautiful of the two.



## RECORD PRICES FOR ORCHIDS.

In 1906, 1,150 guineas were paid at public auction in England for an *Odontoglossum crispium pittianum* Orchid plant consisting of three bulbs and a young break. The blossom is described as being most exquisite in colour and delicacy of form. At the same sale, 800 guineas were paid for an F. K. Sander, 470 guineas for an Abner Hassall, and 400 guineas for a Pittice, and in the previous year 875 guineas were paid for an *Odontoglossum*.

We have, in Queensland, several florists who have been very successful in growing Orchids, notably Mr. Bartels, of Clayfield. From the foregoing, it would appear that a fortune awaits the grower who can produce certain varieties, but, probably, also, it would require a small fortune to obtain the bulbs wherewith to build up the fortune *in posse*.

In purchasing the imported plants be guided by a friend who has had some experience, or you may import some varieties that require a cool-house treatment, and consequently will not stand our summer temperature. Other varieties will not live in a temperature lower than 40 deg. unless protected by a hothouse. If not inclined to invest in the latter, it would be better to avoid disappointment by leaving them out of your collection meanwhile. Get your little collection together, observe their habits, and give the plants the prescribed treatment. If they are slow in starting, change their position, and you may get a pleasant surprise. A poultry farmer would meet with little success if he bundled his Buff Orpington fowls into the duckpond with the Indian Runners, and it is the horse sense that would avoid such a silly mistake that will keep an enthusiastic and interested Orchid-grower from failing with his Orchid treasures.—E. J. BEARD, in the "Queensland Agricultural Journal."

Mr. Beard does not mention *Cypripedium minos*, Young's variety, a very beautiful hybrid between *C. Spicerianum* and *C. Arthurianum* (*Fairrieanum* × *insigne*). This variety was raised, says the "Gardeners' Chronicle," a good many years ago by the late Reginald Young, of Liverpool, and has been shown on several occasions, but failed to get the highest award, although many experts deemed it worthy. Messrs. McBean showed the plant at its best, and at last succeeded in obtaining a first-class certificate. The dorsal sepal is white, tinged and veined with purplish-rose from a small green base. The petals and lip are of a shade of honey-yellow with red-brown. The illustration is also taken from the "Gardeners' Chronicle."

## CARE OF ORCHIDS.

It cannot be too strongly impressed upon the intending Orchid-grower that the plants require abundance of fresh air, and all the ventilation possible. Perhaps the most important point of all in the cultivation of these choice plants is—absolute cleanliness. In their native homes, upon the lofty trees of humid forests, very little dust can ever find its way to them, whereas, in our State, wherever they are grown either in bush-houses or on trees in the garden, or on verandas, they cannot remain many days before they become loaded with dust and dirt. This, as it accumulates, must be scrupulously removed. It is a work of patience, but it must be done, and no plan answers better for the purpose than to use a sponge and soap and tepid water, washing carefully each leaf of each several plant, both upper and lower surfaces, changing the water frequently as it becomes dirty. I need hardly observe that the cleansing work must be done with a light hand, and the plants subjected to no rough usage.

## VARIETIES.

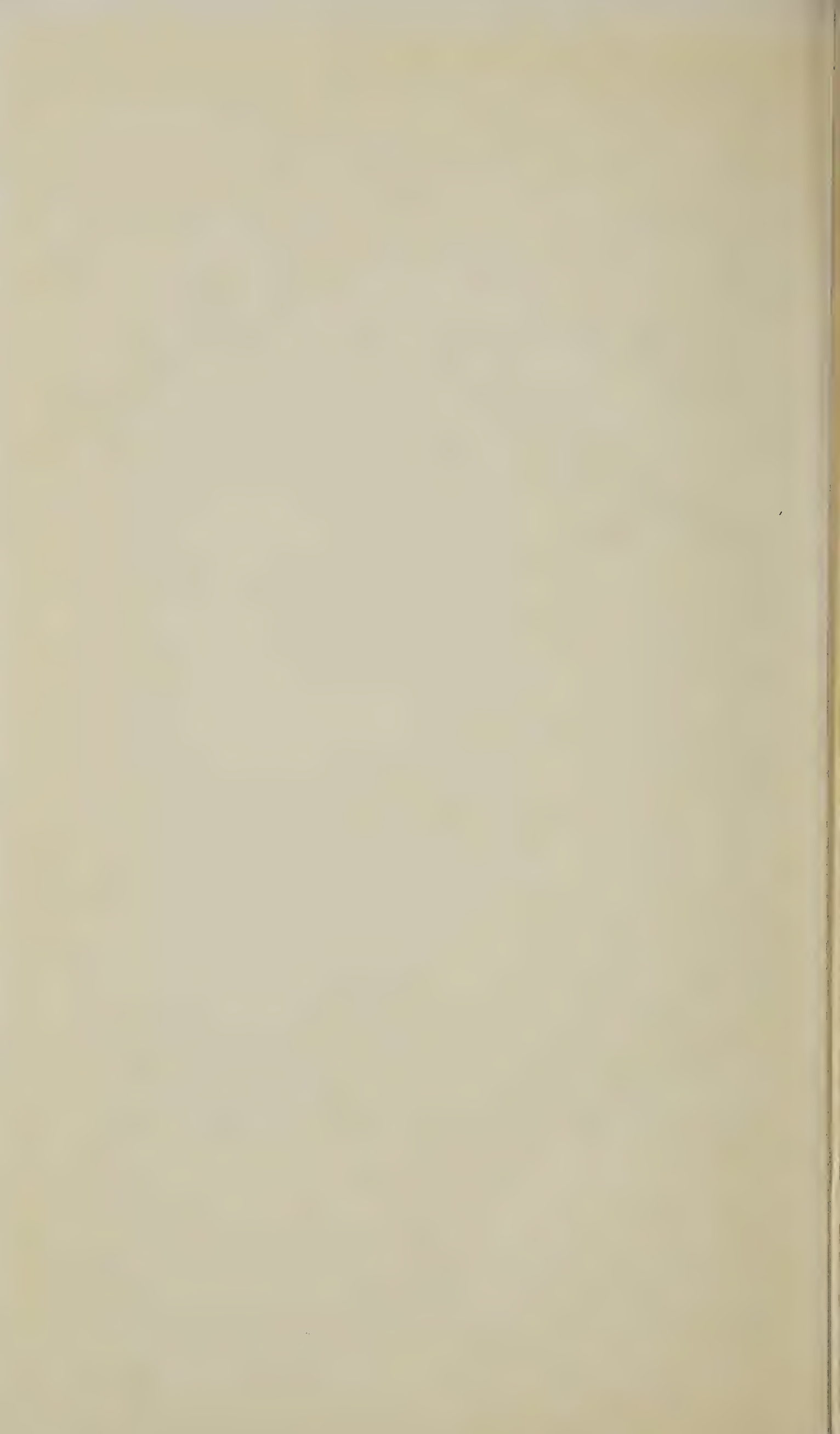
To enumerate the hundreds of species of the many genera of known Orchids would be a task quite beyond what is the limited scope of this dissertation on Orchid-growing. The genus *Dendrobium* alone is said to contain nearly 400 species. *Epidendrum* comprises over 300 species, confined almost



*Plate XLII.*

CYPRIPEDIUM MINOS—YOUNG'S VARIETY.





exclusively to South America. *Coelogyne* is a genus of Orchids entirely Eastern, and most are natives of the hills of India. *Broughtonia sanguinea* is a native of Jamaica with blood-red flowers. *Loelia* is another South American genus, containing some of the most superb of the Orchids. Amongst these are:—*L. anceps*; *L. majalis*; *L. purpurata*; *L. superbiens*; *L. acuminata*, and *L. autumnalis*.

*Cattleya* is a genus closely allied to *Loelia*, and is confined principally to Central America and Brazil. The flowers they bear are accounted to be amongst the largest in the order, some being as much as 7 in. across, from tip to tip of the petals. The finest of all is *Cattleya Warscewiczii*. Next to it stand *C. Mossiae*; *C. labiata*; *C. crispa*; *C. Skinnerii*, and *C. Aclandiae*.

*Brassavola* is a genus of Orchids of Tropical America remarkable for the fragrance of their flowers, with long-tailed petals.

#### PHAIUS.

This is one of the terrestrial Orchids, natives of the East, with yellow or dull-orange flowers. *Thunia olim Phaius*: Grows well in the open ground. *Arundina*: A terrestrial Orchid, native of Nepaul, nearly allied to *Bletia*, a slender reed-like plant, bearing thin purple flowers. *Bletia*: A terrestrial Orchid, native of China, bears abundance of bright pink flowers. *B. verecunda* throws up long flowering stems 3 ft. high, displaying their flowers in full beauty for more than two months. *Spathoglottis* much resembles the foregoing. *Cyartopera* is another terrestrial Orchid of India. Its large flowers are golden yellow; the spike of blossom appears before the leaves.

#### VANDA.

All the species of *Vanda* are very beautiful, especially *V. gigantea*, *V. teres*, *V. cerulea*, *V. Cathcarti*, and some others.

#### RHENANTHERA.

*R. coccinea*: Chinese Air-plant.—Thrives vigorously and blossoms to perfection in a hot climate when bound to an upright log, and exposed throughout the year to the full power of the sun. The flowers are narrow, with bright coral-red petals, of spider-like form, produced in immense profusion.

*R. arachnites*.—This Orchid is also called *R. moschifera*. It bears sprays of about 12 flowers, much like huge spiders, 5 in. across, of a lemon colour with great purple spots, emitting a delicate scent of musk; considered one of the most remarkable of all the Orchids. Requires full exposure to the sun.

#### PHALAENOPSIS.

*P. amabilis*.—Queen of the Orchids—Indian Butterfly Plant. A native of Amboyna; flowers very large, milk-white, leathery; lip marked with purple lines; resembling a butterfly with expanded wings, lasting unimpaired for several weeks. This most choice and magnificent plant is always grown fastened with moss and copper wire upon a log. It may be easily propagated, I am told, by binding a piece of moss round one of the joints of the flowering stalks, which will emit roots, and may then be removed and attached in the usual way to another log.

Other varieties of this species are:—*P. grandiflora*; *P. Schilleriana*; *P. Cornu-cervi*; *P. Lowii*; *P. Parishii*; *P. rosea*; *P. Manneii*; *P. Schumannii*.

The great point to obtain success in the cultivation of these plants, is to render the leaves healthy, by keeping them as well exposed to the light as possible.



## SACCOLABIUM.

The flowers are generally small but borne very numerous in large dense clusters of a plume-like form, most exquisite in colour and delicate in character.

*S. giganteum*.—A magnificent plant from Burmah, with broad, lightest green leaves. Flowers are very fragrant, white, spotted with violet.

*S. guttatum* (syn. *S. retusum*).—Bears spikes of bloom a foot or more long of small white flowers, spotted with rose. Others are:—*S. micranthum*; *S. miniatum*; *S. ampullaceum*; *S. Blumei*; *S. denticulatum*.

## AERIDES.

Flowers resemble in general appearance those of Saccolabium. There is probably no genus among Orchids, the species of which are more generally ornamental—no species not worth growing. Even when not in bloom, the different species, all similar in habit, are all good-looking objects, from the pleasing disposition of their substantial-looking foliage.

*A. affine*.—Native of Assam; bears rose-coloured flowers. *A. odoratum*.—Assam; bears pretty trusses of bloom with small white flowers, tinted and spotted with pink, having the form of a curved horn, and diffusing an exquisite lemon-like fragrance.

Of great beauty are also *A. Lobbii*; *A. Fieldingii*; *A. quinquevulnerum*; *A. virens*; *A. Lindleyanum*; *A. roseum*; and *A. suavissimum*.

## ONCYDIUM.

A genus comprising more than 200 species, confined entirely to tropical America. Many are natives of the mountains and require no very high temperature. Species well worth growing are:—*O. ampliatus*; *O. luridum*; *O. crispum*; *O. bicallosum*; *O. lanceanum*, accounted the most beautiful of all, and *O. papilio*, the famous Butterfly plant.

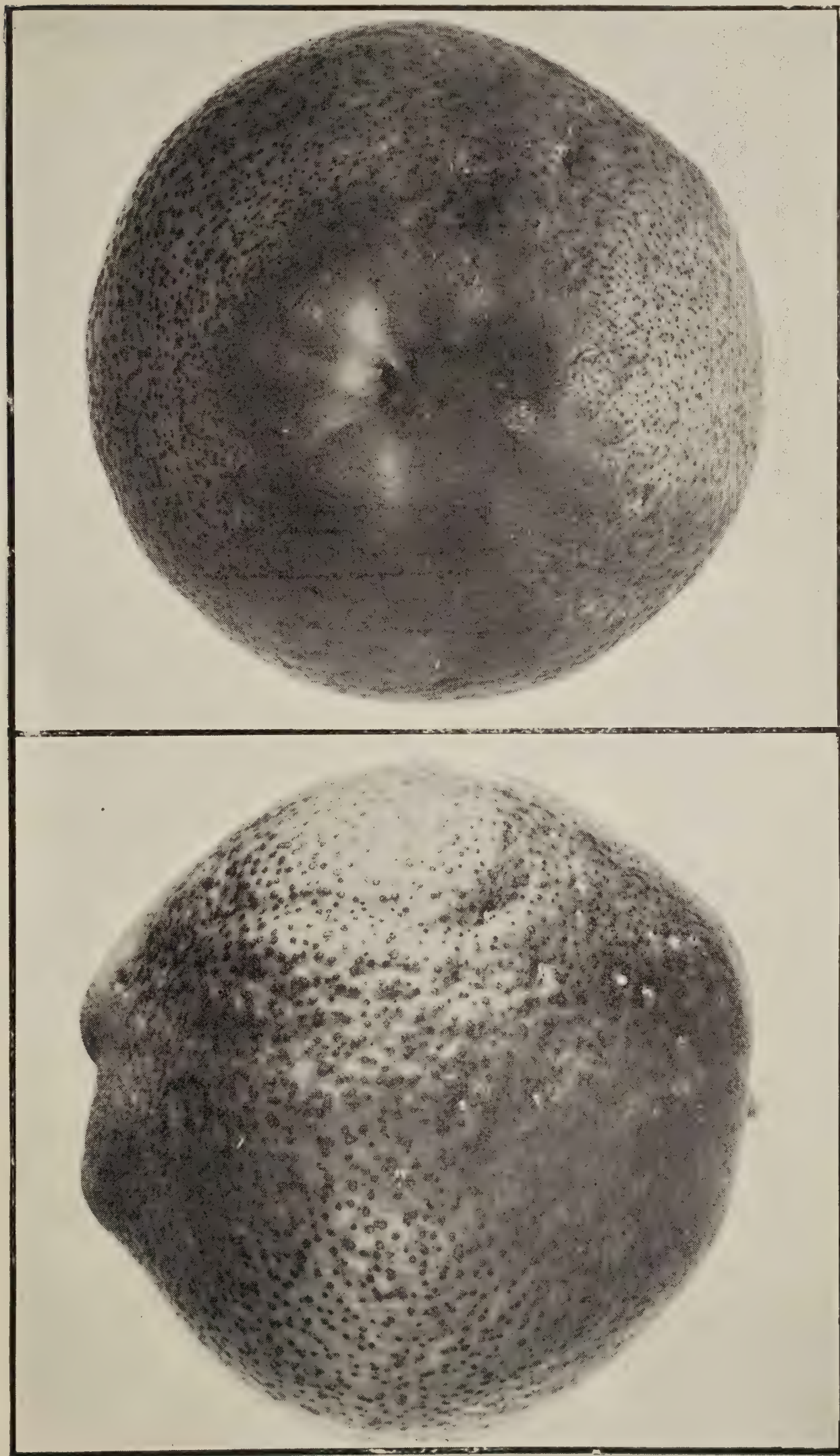
## STANHOPEA.

Plants are remarkable for the way they thrust their spikes of flowers through the bottom of the baskets in which they are suspended. *S. martiana* and *S. tigrina* thrive well in warm countries.

## A LOST ORCHID REDISCOVERED.

In 1905 the "Lost Orchid," *Cypripedium fairrieianum*, was rediscovered by an Englishman, and he, with Mr. S. P. Chatterji, the well-known florist and nurseryman of Calcutta, have the secret of its natural habitat between them. They had, in the year mentioned, a fine stock of the plants, and became entitled to the reward of £2,000 (says "Indian Gardening") offered by a certain London firm of plant merchants to anyone who would rediscover the "Lost Orchid." The locality where this Orchid was found remains a profound secret, at least, such was the statement made at the time, but, suffice it to say, it was *not* found in the Garo Hills, its supposed natural habitat. There was no doubt at all as to the identity of the plant, as it was submitted to Dr. Prain, Superintendent of the Royal Botanic Gardens, Calcutta. This was probably the most important and sensational announcement that the horticultural and botanical world had received for many years. The plant was lost to the world in 1876, and, until its rediscovery, may be said to have been practically extinct in Europe.



*Plate XLIII.*

CLIFFORD'S HYBRID PEAR—WEIGHT, 15 OUNCES.  
Grown by J. Obrist, Broadwater District, near Mount Gravatt.





The Orchard.

A FINE PEAR TREE.

There is an impression amongst many people that such fruits as pears and apples can only be grown successfully on the table-land, in the neighbourhood of Toowoomba, Warwick, Stanthorpe, &c. That this is a fallacy is well shown by the splendid samples of pears grown by Mr. J. Obrist, an orchardist living some 5 miles beyond Mount Gravatt, near the Broadwater. We saw one particular pear tree in this orchard, fruiting heavily, and Mr. Obrist last month brought a sample to this office of Clifford's hybrid pear, here illustrated. Each fruit weighed 15 oz., was well-shaped, and of excellent flavour. There was a good crop on the tree, but much was damaged by the opossums in spite of all care. Mr. Obrist, every year, places thousands of grafted trees of various kinds on the market, particularly citrus trees, persimmons, custard apples, peaches, and mangoes. If he were to do the same with his pear trees, he would doubtless be equally successful. We might bring to the recollection of our older readers, that splendid apples were grown by the first Anglican Bishop of Brisbane, Dr. Tufnell, at Bishopsbourne. There the soil is exceedingly poor, resting on a substratum of shale, yet the apples we saw there could not be beaten even at Stanthorpe.

Statistics.

COMMONWEALTH METEOROLOGY.  
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1908.									1909.			
	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.
<i>North.</i>													
Bowen ... ..	3.73	0.99	0.45	0.88	0.51	0.96	2.47	0.42	0.42	15.48	4.52	1.06	1.1
Cairns ... ..	5.99	3.05	0.59	3.70	2.12	0.74	3.07	1.60	1.41	32.05	5.25	21.03	14.
Geraldton ... ..	14.23	18.52	2.64	8.11	3.66	2.81	6.93	3.80	1.69	47.92	10.29	37.31	28.51
Gindie State Farm ...	0.02	0.112	...	0.40	1.27	...	...	...	...	...	...	...	...
Herberton ... ..	1.40	0.38	0.31	2.36	Nil	0.51	1.27	0.61	0.78	12.41	2.28	3.52	0.70
Hughenden ... ..	0.30	Nil	0.05	0.68	Nil	Nil	1.67	1.94	1.05	7.55	1.55	2.86	...
Kamerunga State Nurs.	4.60	3.363	0.76	4.85	1.58	...	3.64	1.69	...	...	3.52	...	4.95
Mackay ... ..	14.82	3.25	1.29	1.65	0.71	2.27	1.80	2.57	0.02	15.00	1.36	9.00	2.59
Rockhampton ... ..	2.62	0.85	0.10	1.08	0.84	0.20	2.14	2.47	1.37	9.01	2.01	1.68	1.21
Townsville ... ..	0.38	2.22	Nil	1.70	0.27	0.28	1.58	1.26	0.07	6.94	1.70	7.01	1.28
<i>South.</i>													
Biggenden State Farm	2.97	0.74	0.43	0.49	2.33	1.39	1.80	2.12	3.66	7.37	2.68	2.45	2.00
Brisbane ... ..	2.45	2.40	0.17	0.77	2.83	0.67	1.77	2.25	1.28	1.99	2.72	2.65	4.67
Bundaberg ... ..	4.13	0.67	0.39	0.75	1.56	1.10	2.39	0.73	3.34	6.52	3.70	5.06	1.54
Dalby ... ..	0.11	0.37	0.63	0.14	1.80	1.13	2.55	3.65	1.56	1.46	3.55	0.99	1.60
Esk ... ..	2.83	1.07	0.23	0.46	2.75	2.16	1.29	5.99	3.62	2.64	3.21	3.27	5.03
Gatton Agric. College	...	0.10	0.16	0.6	2.71	1.84	1.93	5.71	1.29	1.94	5.00	3.18	3.82
Gympie ... ..	1.87	2.00	0.38	1.16	2.87	1.37	2.49	2.58	3.97	3.86	3.77	3.41	2.34
Ipswich ... ..	2.71	1.14	0.12	0.47	3.23	1.19	1.48	5.09	1.05	1.37	1.95	2.66	4.56
Maryborough ... ..	2.52	1.05	0.46	0.81	1.98	1.05	1.84	1.92	1.64	8.36	7.11	2.28	2.44
Roma ... ..	0.22	Nil	0.55	0.63	1.38	1.12	2.15	2.79	1.68	5.19	4.85	4.18	1.91
Roma State Farm ...	...	...	...	1.27	0.73	...	...	...	...	...	...	...	...
Tewantin ... ..	7.59	8.66	0.75	1.97	2.70	2.18	2.30	7.50	4.12	6.44	3.31	4.34	9.37
Warwick ... ..	1.40	0.15	0.80	1.24	2.99	1.96	0.96	5.28	2.02	0.87	0.82	1.30	2.21
Westbrook State Farm	1.40	00.5	...	0.49	1.97	...	...	2.05	...	...	2.61	1.43	...
Yandina ... ..	5.45	4.59	0.58	2.64	2.18	1.50	3.10	6.03	2.75	6.69	6.42	3.71	5.25

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,  
Divisional Officer.



## Tropical Industries.

### CASSAVA.

Under the name of "American potato" we lately received a specimen of the cassava plant and tuber from a correspondent who had never seen a cassava plant before. He found that the tubers were similar in taste to a sweet potato. In view of this, it is well to warn those who do not know the plant, of its poisonous qualities.

In the tropical regions of South America and in the West Indies cassava forms a valuable article of diet under the name of manioc or manihot. Of this plant there are two varieties—the sweet and the bitter, although some botanists maintain that the sweet variety is merely a sport of the bitter. In the tropical countries named the bitter cassava is an important cultural plant, not only as producing an article of native food in the shape of cassava flour, but also the well-known tapioca of commerce.

The plant itself belongs to the semi-wooden shrubs. The stem is full of pith, and attains a height of from 5 to 6 ft., and under favourable conditions of soil and climate even as much as 8 ft. The leaves are of a bluish-green, divided somewhat similarly to those of the papaw. The value of the plant lies in its large tubers, which attain a weight on an average of 8 or 10 lb., with a length of from 18 in. to 2 ft. These tubers are brown or dark-yellow, and contain a quantity of highly poisonous juice.

The poison, however, is, fortunately, very volatile, consisting of hydrocyanic (prussic) acid. In the bitter variety the poison is distributed throughout the root, while in the sweet cassava the poisonous principle is chiefly in the rind. It is on record that on 50 lb. of the juice being distilled, 3 oz. of distillate were obtained, and 35 drops of this killed a man at once. Bitter cassava root sliced and dried yielded from the root 0.09 per cent., and from the rind, 0.035 per cent. of hydrocyanic acid. The glucoside, by the decomposition of which the hydrocyanic acid arose, was determined to be identical with phaseolunatin from Lima bean seeds.

In New Guinea, a few years ago, a Mr. English, a sisal planter, planted an area of cassava, intending it for native food. Unfortunately, about twenty of his boys partook of the cassava tubers imperfectly cooked, with the result that he with difficulty saved the lives of nineteen, one boy actually dying.

The bitter cassava can be distinguished from the sweet by the leaves. In the former the leaves have seven divisions, the latter only five, the root also of the sweet variety is smaller and reddish in colour, and does not contain so much farina as the bitter, hence the latter is almost exclusively cultivated in countries where cassava flour is a principal article of native diet.

### CULTIVATION.

The planting and cultivation of the cassava plant is as simple as for arrowroot, but it should only be grown near the coast, where atmospheric moisture is found even in the absence of rain. It is only during the first two months after planting that a good rainfall is necessary; after that the plant will thrive without any further showers.

The soil must be rich, well-drained, and deeply worked. Wet ground must, above all, be avoided, since too much moisture causes the roots to rot. The plant is reproduced in the same way as sugar-cane—by cuttings from the stem. Only the tough wood of the full-grown stems should be used for cuttings. These, which should be about 1 ft. in length, are laid in the furrow





OLD KANAKA HUTS AND FIELD OF CASSAVA AT FARNBRO', CHILDERS.





and covered as is done with sugar-cane cuttings. On very rich land the rows should be from  $3\frac{1}{2}$  to 4 ft. apart. So quickly do the cuttings grow that after two months the shoots will attain a height of 1 ft., and six, or at most eight weeks later, the plants will have taken such possession of the ground as to prevent the growth of weeds, and thus further cultivation becomes unnecessary. In about eight months after planting the tubers are ready for digging, but they will take no harm if left in the ground for a year and taken up as required.

The resulting crop on rich land or with good fertilisers will amount to from 6 to 8 tons per acre, and the digging can be done for about 2s. per ton.

The following estimate of cost of producing a crop and profit is furnished by a cassava planter in Florida:—

	s.	d.
Ploughing per acre ... ..	6	0
Harrowing per acre ... ..	1	$5\frac{1}{2}$
Cuttings planted 4 feet x 4 feet ... ..	6	11
Planting per acre ... ..	4	0
Six cultivations ... ..	8	5
Four hoeings ... ..	16	0
Fertiliser (if required) 350 lb. per acre, at £5 per ton ...	16	0
Digging and hauling (say 1 mile) ... ..	5	0
<b>Total ... ..</b>	<b>£3</b>	<b>3 9<math>\frac{1}{2}</math></b>

Value per ton, £1. To pay expenses a crop of 4 tons is required. Therefore, on an 8-ton crop, the net return per acre is about £4 16s. 2 $\frac{1}{2}$ d.

#### HARVESTING.

The stems are first cut above the ground, when the tubers are drawn out. Any which break off are afterwards taken up with a hoe or ploughed out, or the whole crop may be ploughed out. The tubers are then carted to a shed, where they are separated from the stems, these latter being preserved for setts for the next planting.

Cassava being a very exhausting crop, it should not be planted more than two or three times in succession on the same land.

#### PREPARATION OF THE FARINA.

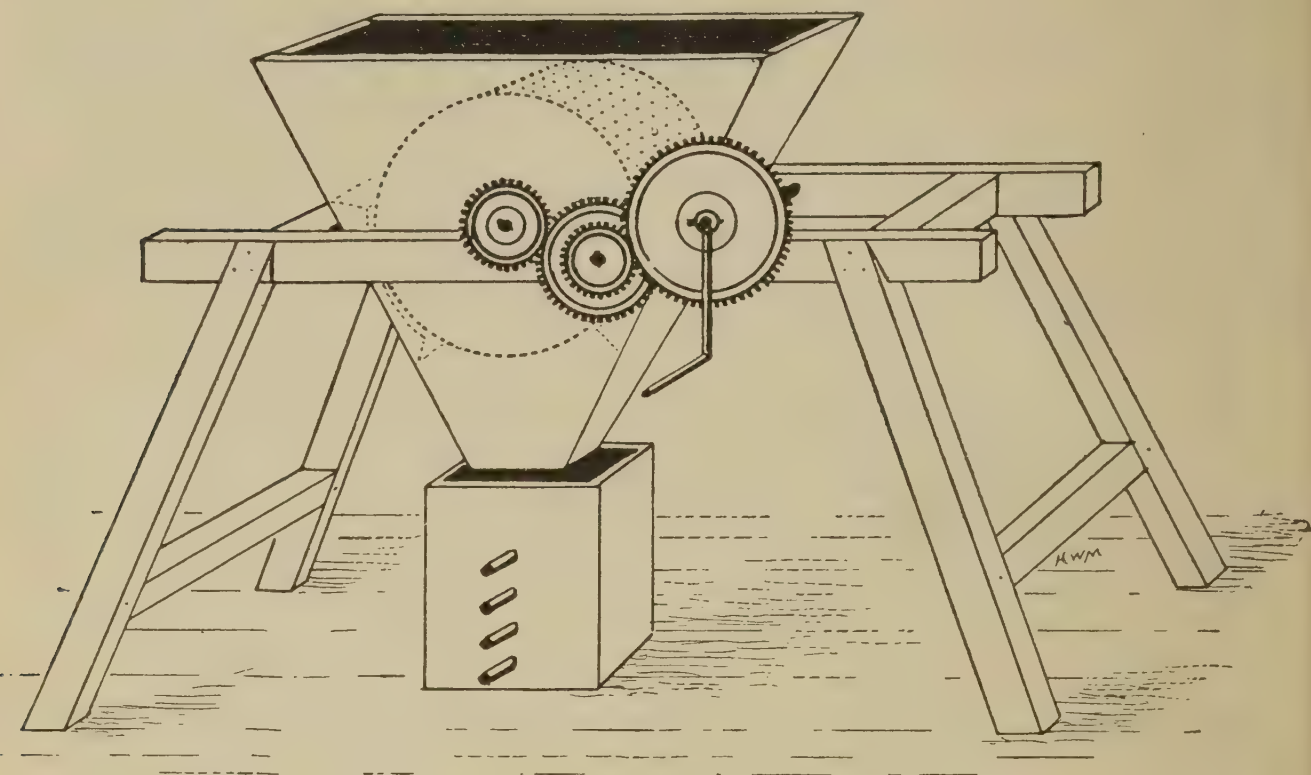
The process in British Guiana is as follows:—

The root is rasped on large tin or wooden grates fixed on benches. A sufficient quantity having been rasped for one time—for any surplus would ferment and spoil—it is put into long, circular baskets of plaited rushes, about 10 ft. long and 9 in. in diameter, called “mangueras.” These are hung up with weights attached to the ends, which draw the plaited work tight together, diminishing its capacity, and squeezing out the juice. When all the fluid is extracted, the mangueras are emptied of their contents on to raw hides laid in the sun, where the coarse flour soon dries. It is then baked on smooth plates made of dry clay, with a slow fire beneath. This is the most difficult part of the process. The coarse flour is laid perfectly dry on the hot plates, where it is spread out in a round and very thin layer, nearly the size of the plate it is laid on. The flour is kept in constant motion until the heat has, with gentle pressure added, united it into a cake, without altering the colour or scorching it. This is the native bread, and it is very nourishing, and will melt to a jelly in a liquid, but it is dangerous if eaten in any quantity when dry, as it swells, on being moistened to many times its original bulk. The expressed juice deposits, after standing for some time, a fine white starch which is not to be distinguished from that prepared from arrowroot.

The cassava farina constitutes the tapioca of commerce when heated on hot plates, which causes the grains to swell, many of them bursting, and the whole agglomerating into irregular masses or lumps. The finest are sold as



tapioca, the intermediate sample being used for starch. There are large plants for the making of tapioca, but much of the tapioca of commerce is produced with simple appliances such as here shown.



CASSAVA STARCH HAND MILL.

The roots of the cassava are well washed and peeled to get rid of as much of the poisonous principle as possible. If they are left for a couple of days in water, the skin comes away easily. They are then passed through the grating machine, continuous streams of water being poured upon the grated mass to separate the starch from the fibre. When the starch has settled in the vats, the water is gradually drained off through a series of taps, one above the other. More water is added and the starch well stirred, and again allowed to settle, the water being drained off as before. This process is continued until the starch is perfectly white. When the surface is dry, it is cut out in lumps, which must be thoroughly dried on airy shelves before they are placed on horizontal tin plates, beneath which is a hot-air pipe in which a particularly gentle heat is maintained. In Europe, tapioca is usually sold in the form of flakes, which are made by placing the lumps of starch, in a nearly dry state, in deep pans, where they are subjected to strong heat, and are continually stirred about until they have acquired the desired form.

In the Straits Settlements "Pearl Tapioca" is made in the following manner:—

The dried masses of starch are placed in a hand mill, where they are reduced to the size of No. 4 shot. From the roof of the factory hangs a coarse cloth, like a veranda hanging mat or blind, kept spread out by a crosspiece of wood, so that it looks like a canvas boat. The cloth is filled with the shot-like starch, and it is then swung backwards and forwards by two men. Under this treatment the grains are ground into perfectly round little balls, which require to be once more warmed for half-an-hour by gentle heat in a pan, when the process is complete. In fine weather they are often exposed for half a day to the sun's heat.

In the cassava plant we have a raw material which yields a starch of the highest purity, possessing all the characteristics of the maize product, the cost of production being one-fifth that of maize. In experiments made in Florida with fresh roots, the average percentage of starch was found to be 24.75, and with Jamaica roots 26.23; 4 per cent. of cane sugar was also

recovered from the liquor. Compared with maize and potatoes, upon which practically the whole world depends for its supply of starch, the average yield of starch is as follows:—Maize, 53; potatoes, 18; cassava, 25 per cent. An acre of ground yields 40 bushels of maize (on an average), which, in turn, yield 1,200 lb. of starch, whilst the same ground will yield 10 tons of cassava, yielding 6,720 lb. of glucose and 5,000 lb. of starch, and it is possible to reach a much greater amount. In Queensland 12 to 14 tons of casava roots could be raised on an acre of our rich, virgin, northern scrub lands.

The only cassava starch factory in the world is in Florida, U.S.A., and there cassava costs  $\frac{1}{4}$ d. per lb. in the unmanufactured state.

A plant has been devised by means of which the whole 25 per cent. of dry starch can be obtained, and this plant can be worked 25 per cent. cheaper than the potato starch plant, the process being perfectly automatic and continuous. The plant will work up 100 tons of roots per day of ten hours. The entire process occupies three days, when the starch is ready for market, while maize, under the most favourable conditions, requires from twelve to fourteen days.

As regards the process of manufacture of the starch, it is so similar to that adopted in Queensland for the production of arrowroot starch that it need not here be described. An account of the process, however, will be found in the issue of the "Queensland Agricultural Journal" for May, 1903.

It is unquestionably true that as a food for farm stock, cassava comes nearer supplying a perfect ration than any other concentrated food produced on the farm. Experiments in feeding stock have proved it to be the best and cheapest ration which can be used for fattening purposes. The most astonishing fact, however, is the great difference demonstrated between the cost and the result of feeding corn and feeding cassava, the difference being almost two-thirds in favour of the latter.

In conclusion, the cassava plant will thrive under the most diverse conditions of climate (frost excepted), on dry plains, on rocky hillsides, as well as on the humid plains and hills wherever the soil is friable or gravelly. The tubers can be dried and stored to keep for some time, thereby reducing the weight for transport to a distant factory, and thus the factory can be kept going most of the year.

---

#### MANILA HEMP MACHINE.

The extraction of the fibre of the *Musa textilis*, otherwise known as Manila hemp, has hitherto been effected practically by hand labour, although the native workmen employ a primitive kind of implement to extract the fibre, which yet entails severe manual labour. Numerous inventors have taxed their ingenuity to produce a machine capable of extracting the fibre with the same ease and speed as in the case of flax and sisal hemp, but hitherto with poor results. In conversation with a gentleman who has spent many years in the Philippines, it was elicited that no less than forty inventors had patented machines for this purpose, and companies were formed who had paid as much as 100,000 dollars for the patent rights of some of these inventors.

It seems, however, as if the problem of a stripping machine has at last been solved by an Australian, a native of West Maitland, Mr. J. S. Gillies, a nephew of Mr. J. Gillies, M.L.A. Young Mr. Gillies worked at his idea for seven years. Twice he exhausted his little capital, and offered to sell a half-interest in his machine for 500 pesos, or about £50; but, fortunately, he was unable to find a buyer, but a company was formed for the purpose of



manufacturing and placing the machines on the market. The "Far Eastern Review" contains the following account of Mr. Gillies' invention:—

"No one who has seen the Philippine hemp machine, manufactured by the Philippine Hemp Machine Company, in operation, will deny that it is destined to revolutionise the hemp industry. It is bound to do for the Philippines what the cotton-gin did for the South. It is, in a word, one of the most marvellous pieces of machinery ever built, and is, at the same time, simplicity itself, and in spite of the oft-proclaimed statement that the ingenuity of man would never be able to build a machine that would strip hemp as clean and quickly as it is done by hand, Mr. J. S. Gillies, to whom the credit for the patent is due, was able to figure out a machine that not only strips hemp a hundredfold more rapidly than it could possibly be done by hand, but produces a cleaner and stronger fibre.

"It makes no difference how long a strand of hemp stripped by the machine may be, it is as strong at one end as at the other, and, what is more, there is absolutely no waste whatever, every inch of the fibre being as clean and useful as only certain parts of hand-stripped hemp can possibly be; and in fact, marvellous as it may seem, all the weak strands are eliminated. The tensile strength of hemp stripped by this machine shows, by actual tests made by the Bureau of Science of the Philippines Government, to be from 80 to 100 per cent. above that of hand-stripped hemp. This is a wonderful thing in itself, and if the machine did nothing else it would still sustain the claim of being one of the greatest inventions of recent years. But it does still more. For instance, the hemp comes from the machine absolutely clean and with no pulp adhering to it. This means that hemp stripped by the machine will not contain tangles and snarls, which always result in a loss to the manufacturers who make up the raw product. The juice of the hemp plant is totally extracted. This means that all sugar and tannic acid is removed, which minimises the chance of decomposition, and guarantees a bright, glossy, snow-white product. There is another advantage to this feature. By coming from the machine in almost a perfectly dry state, it is possible to bale the product the day it is stripped, something undreamed of with hand-stripped hemp.

"The above is a brief summary of what the machine is capable of doing. Now for a few words about the machine itself. It weighs about 650 lb., and it is possible to transport it easily from one part of a hemp plantation to another. One of the greatest drawbacks to many hemp machines of any ability at all has been their lack of portableness. With this machine a small petroleum motor can be attached, which will enable it to be operated anywhere and under the most adverse conditions. It has been demonstrated beyond a question of doubt that the machine is capable of performing the work of 100 operators doing the same work by hand.

"It has been a long, and, one might add, a discouraging task to complete this wonderful machine. It is the outcome of the idea of Mr. J. S. Gillies, who worked at it for more than five years. As two heads are always better than one, when Mr. M. A. Clarke, the president of the company that owns the patents, and is now engaged in manufacturing the machines, took hold, he called in Mr. R. A. Wilson, a mechanical engineer, who assisted Mr. Gillies to perfect the machine in many details.

"It is estimated that the hemp crop will exceed 1,000,000 bales in the Philippines this season, which would require a large number of machines. In fact, it would be impossible to strip this amount of hemp entirely by hand. The Philippines Hemp Machine Company, the owners of the patents, have recently sent Mr. R. A. Wilson to the United States to superintend the construction of a large number of machines, which, in due season, will be stripping hemp in all of the fibre-growing districts of the Philippines.



"The original capital of the company was 50,000 pesos, but, owing to the fact that the machine has developed a capacity far beyond the dream of its inventor when he began the construction of the original model, which will mean a great demand for the machines, the company has decided to increase its capital stock to 1,000,000 pesos. It is the intention of the company to sell 50,000 pesos worth of the shares—valued at 100 pesos each—at the present time, and on 4th December a circular letter was sent to each of the shareholders informing them of this decision, and advising them that present shareholders would be given preference over outsiders in the allotment of the new shares.

"The officers of the company are:—M. A. Clarke, president; J. S. Gillies, vice-president; A. W. Beam, secretary; and A. R. Wilson, mechanical engineer. The offices are in Manila.

"The greatest credit is due to the keen perception and hustling qualities of Mr. Clarke for making it possible to have this machine perfected. From the first time it was shown to him in the drawings he saw what it meant for the Philippines, and he lent every assistance possible to the inventor and others interested to bring it to its present state of perfection. It means a revolution in the hemp industry the world over."

---

#### NOTES FOR FARMERS ON THE FIBRE INDUSTRY.

We have frequently suggested to farmers who have portions of stony land on their farms where no cultivation can be done, and which produce nothing but weeds and brambles, to plant up such spots with Sisal or Fourcroya. If several farmers would do this, the combined area would enable them in the course of four or five years to set up a central mill, which would enable them to realise a handsome profit from land, which let alone, as it now is, not only gives no return, but acts as a nursery for noxious weeds.

Mr. Leonard Cutt, of Tongaat, Natal, whose report on the fibre industry in Mauritius last year created great interest amongst the farmers not only of Natal but of other parts of Africa, says that it was in consequence of that report that three gentlemen in that colony imported over half a million sisal bulbils to start the industry on a large scale. We believe that these bulbils were purchased from a sisal-grower in Queensland, and were shipped a few months ago to Mombasa from Brisbane. Mr. Cutt has again written on the subject, and amongst other things he says:—

What a field there is in the growth of wild aloes in this manner, and without taking up land on which something else can be grown.

When one contemplates the potentialities of fibre culture in this way [that is, without any cultivation.—Ed. "Q.A.J."], one wonders that the idea does not seize upon the mind of the people, but to dip in Jordan is, of course, too absurdly simple.

Hundreds of thousands of acres of practically desert country in the valleys of the Tugela, Umvoti, Bushman's, and Blue Krantz Rivers might be utilised, and Zululand could spare as many acres more and not miss them.

If Mauritius, a small island, only 34 miles by 22 miles, containing only 456,320 acres, can on its waste land produce £100,000 worth of fibre, as it has done, although the value of the output for the last four years was only £45,000 a year, what could Natal produce on its 16,000,000 acres, exclusive of Zululand?

A great industry is ready to our hand, and one not requiring a large outlay. Let us put out our hands and take what is so obviously within our reach.—"Natal Agricultural Journal," Vol. XI., No. 12, December, 1908.



## Botany.

### CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By F. MANSON BAILEY, F.L.S., Colonial Botanist.

#### Order CAPPARIDEÆ.

##### CAPPARIS, Linn.

*C. canescens*, *Banks*. Add to the description, page 59 of Ql. Fl. Peduncles 2 to 3 in. long, stout; stipes 2 to 3 in. long, stout; fruit about 2 in. long,  $1\frac{1}{2}$  in. diam., shortly tapering at the base, and more or less umbolate at the apex, and more or less prominently ribbed in the lower half and very slightly tuberculate. Seeds orbicular-ovate, about 5 lines diam., smooth.

*Var. glauca*, *Benth*. Add fruit almost globular,  $1\frac{1}{2}$  to 2 in. diam., irregularly covered with thick flattened tubercles, which sometimes form irregular thick wings reaching from top to bottom of the fruit. Seeds few, large.

#### Order EUPHORBIACEÆ.

##### EXCÆCARIA, Linn.

*E. parvifolia*, *Muell. Arg.* Add to description, page 1457 of Ql. Fl. Female flowers sessile, two or more together on very short angular bractiferous peduncles; bracts orbicular, margins hairy. Ovary  $\frac{1}{2}$  line long, broader than long, 2 or 3-celled; styles 2 or 3 recurved; nearly or quite free. Capsule smooth, 3 lines diam., 2 or 3-celled, bearing the persistent styles. Seeds smooth.

#### Order URTICACEÆ.

##### FICUS, Linn.

*F. eugenioides*, var. *puberula*, *Benth*. Fl. Austr. VI., 167. Specimens of this plant have been received from Dr. T. L. Bancroft, Stannary Hills.

#### Order GRAMINEÆ.

##### DIPLACHNE, Beauv.

*D. parviflora*, *Benth*. Fl. Austr. VII., 620. A glabrous erect grass of 2 or 3 ft. Leaves convolute, with long rather loose sheaths, the ligula jagged. Panicle narrow, dense, varying from 3 to 10 in., with long erect simple branches. Spikelets very numerous, sessile or nearly so, 3 to 4 lines long, very narrow, 5 to 7-flowered. Outer glumes about  $1\frac{1}{2}$  lines long. Flowering glumes shorter, glabrous on the back, the margins ciliate, the lateral nerves scarcely distinct, the keel produced into a short point, the lateral hyaline lobes adnate to it almost to the top. *Triodia parviflora*, R. Br. Prod.; *Pestuca Brownii*, F. v. M. Fragm. VIII, 129. *Benth.*, l.c.

Hab: Arnhem S. Bay, R. Br., and North-west Coast, *Hughan*, Roma, Queensland, C. T. White, April, 1909.

## Animal Pathology.

### CONTAGIOUS ABORTION.

By SYDNEY DODD, F.R.C.V.S., Principal Veterinary Surgeon and Bacteriologist.

This condition is known by other names such as slipping or slinking the calf, picking, warping, and miscarriage. Technically speaking, a distinction is made between abortion and premature birth, but for all practical purposes it may be broadly stated that abortion in relation to stock refers to the expulsion of the foetus or young immature animal from the womb before its time, and usually before it is capable of a separate existence.

All animals are liable to be affected with that form of abortion known as "contagious," including cattle, sheep, horses, and goats; but it is amongst dairy cows and heifers that it occurs most frequently, and is more serious from a financial point of view.

Single animals at any period may cast their young from various causes, such as general debility, fright, worry, strain, indigestion, bloating, blows, early breeding, feeding on grasses infested with ergot or smut, acute fever, or contagious diseases, such as tick fever, or pleuro-pneumonia; but under the head of "contagious" are classed those abortions which usually affect many animals in a herd, stud, or flock, and the existence of which usually appears to depend upon some former case.

Contagious abortion is a disease widely spread throughout the world, and in Australia, generally, considerable pecuniary losses are experienced by owners of dairy herds in various places by its effects. In Queensland there is evidence that it exists in various parts of the State, although at present not to any alarming extent, but its presence has often not been recognised by the owners of the herds concerned. The condition of affairs calls for action on the part of the owners of dairy herds, not only of those whose herds are affected, but of those whose herds are free from the disease: the former, in order to eradicate it from their animals; and the latter, in order to prevent its introduction. Action is needed, because the disease can be prevented and extirpated by perseverance and vigilance, and now is the time to take the necessary measures before the disease has obtained a firm foothold amongst the dairy herds in the State.

Contagious abortion is usually introduced into a clean herd by the purchase of a cow from an infected herd, or by a bull which has served an aborted cow. The practice of borrowing a bull from a neighbour is not an infrequent means of its spread. Examination of the newly introduced animals is useless, as it is practically impossible for a stockowner to tell whether a strange cow has aborted or not, or whether a bull has recently served an aborted cow. Some owners, when they find they have a cow which aborts, will sell the animal, and the purchaser, not knowing its history, will innocently be the means of infecting his own herd. Such a proceeding is one which cannot be too severely condemned, and it should be an offence to sell an animal from an aborting herd without stating the fact to the intending purchaser.

There is at present considerable want of knowledge amongst a large proportion of dairymen in the State as to the true nature of the disease; and letters are often sent from various sources inquiring why their cows slip their calves or why a large percentage remain barren?



## THE CAUSE AND NATURE OF THE DISEASE.

The researches of Dr. Bang, the Danish veterinary surgeon, proved that contagious abortion was due to a specific germ. He discovered this germ in the envelopes of the foetus and between them and the walls of the womb during life before abortion occurred; also, in the abortion, the after-birth and the discharges from the genital passages of the animal which had aborted, and, by his introducing these germs into the genital passages or into the veins of a healthy in-calf cow, abortion was brought about. From this it is very evident that the aborting cow is a source of danger to healthy cows so long as the former harbours the virus or distributes it by the discharge from the genital passage, and it is only by preventing access of these germs to healthy animals that the stock-owner can hope to prevent an occurrence of the disease. Anything contaminated by the discharge from an aborting cow may be the means of conveying the disease to a healthy one; hence it will be understood that the floors, &c., of the bails, the spot in the paddock where the abortion has been dropped, certain parts of the animal which are soiled by the discharge, especially the tail, or a bull which has served an infected cow, may be a source of danger.

## SYMPTOMS.

The symptoms of oncoming abortion are often very slight, and frequently there are no signs at all to warn the owner of the approaching trouble. The animal may be uneasy; sometimes there are slight colicky pains. There are modified indications of calving, and the milk is generally increased for no apparent reason. There may be a discharge from the genital passage. In a great many cases, however, the first indication the owner has that something is wrong is that the cow comes to the bull again about six or eight weeks after service. When a cow has slipped her calf, she usually comes into service from three to eight days after the abortion has occurred. In the great majority of cases, under the conditions obtaining in this State, first abortions are overlooked, and healthy animals may be contaminated before the presence of the disease is known. On the other hand, an infected cow may carry her calf at full time, but although this may happen, yet the cow is a source of danger to others.

An infected in-calf cow is liable to abort at any time, but the greatest number of abortions occur after the animal has been in calf about four months, and it is very important to bear in mind that a cow or heifer once aborted as a result of infection almost invariably has a tendency to abort again.

## TREATMENT.

When a cow has aborted, the foetus or stillborn calf, together with the after-birth, should be burned and the ground upon which it has fallen well disinfected. Sheep dip or quicklime will do for this purpose. The aborted cow must be isolated from the healthy cows for two months; if practicable, using a separate bail for milking. Knowing that the disease is a highly contagious one, and that the germ causing it may be easily conveyed to healthy animals by any material soiled by the discharge from the genital passage of an infected cow, all endeavours should be directed towards preventing the contamination of the healthy cows taking place.

The aborted animal should then have her womb washed out with a solution of 1 part of perchloride of mercury (corrosive sublimate) in 2,000 parts of water. This chemical is highly poisonous, and should be kept away from stock or human beings.

Tabloids of corrosive sublimate may be readily obtained from a chemist, of such strength that one tabloid dissolved in a pint of water makes a 1-in-1,000 solution, and one dissolved in a quart of water makes a 1-in-2,000



solution. It should be made in an enamelled or wooden vessel, not a plain metal one, as this chemical has a corroding action on metal.

The solution for washing out the womb, &c., should first be made warm (blood heat), and the injection performed by means of an enamelled or glass funnel to which is attached sufficient length of rubber tubing (about 3 feet), with a bore of about  $\frac{1}{2}$  an inch. A metal syringe cannot be used for reasons just given.

The hand carrying the free end of the tubing is inserted into the womb of the cow, care being taken not to injure the lining of the womb. The funnel is then held above the root of the tail, and about half a gallon of the corrosive sublimate solution poured into it. The fluid will gravitate into the womb. This should be done daily for a week. Besides this, every part that the tail can reach—such as the hindquarters, tail itself, back parts, escutcheon, and udder—should be washed down with the same kind of solution.

If the animal strains very much after injection, a dose of laudanum (about 2 tablespoonfuls in a pint of water) may be given as a drench by the mouth, but if she is allowed to rest quietly, as a rule, there is no occasion for alarm.

In the case of the other cows, one injection into the vagina is sufficient; but the external parts—such as the passage, tail, back parts, and udder—should be washed daily with the solution. The strength of this solution should be 1 part in 1,000 of water.

The floor and sides of the bails should be washed down once or twice a week with a solution of 1 part of copper sulphate (bluestone) in 20 parts of water. The person attending aborted cows should not attend healthy ones, or, where this is not practicable, he should thoroughly wash his hands in disinfectant before so doing.

The bull, if he has served an aborting cow, should be put in a crush and have his penis and sheath washed out with the corrosive sublimate solution (1 part in 2,000) daily, or at least after each service. It is not safe to use such bull for healthy cows for at least some weeks.

Do not allow the bull to serve outside cows.

Do not put an aborting cow to the bull for two or three months after abortion.

When abortion is present, the bull should not be allowed to run with the herd, as the practice of doing so is one of the factors in spreading the disease.

If only one cow is abortive, the cheapest and safest plan is to isolate her and fatten her for the butcher.

In order to prevent the disease being brought into healthy herds—

No outside bull should be allowed to serve the cows, nor should any outside cows be served by the bull. If this is done, however, he should be treated just as if it were known that he had served an infected cow.

It is not always practicable to isolate newly purchased cows or heifers; but they should be prevented from coming in contact with the rest of the herd until they are ascertained to be free from risk of infecting the latter, and their back parts, during this period, washed regularly as previously described while undergoing the quarantine.

The foregoing instructions entail a considerable amount of patience and perseverance, but they must be carried out thoroughly to ensure success. Half-hearted measures are worse than useless, as they tend to discredit a method of treatment which is known to be effectual. With determination and thoroughness, the disease will be conquered, although it must not be expected to disappear at once.

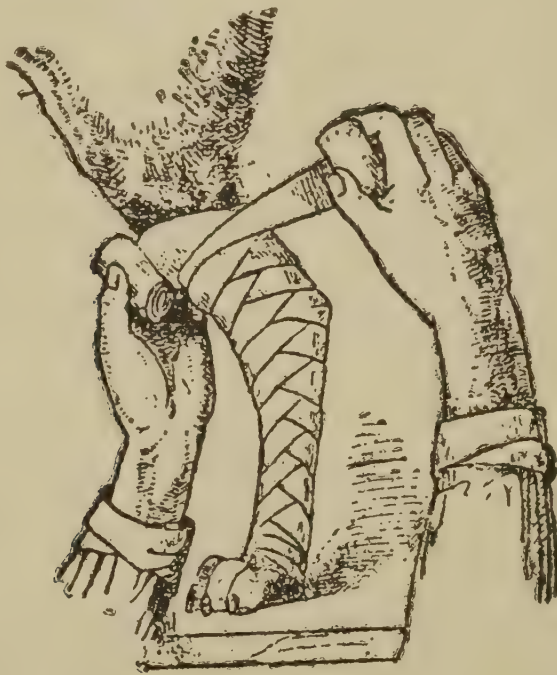


## General Notes.

### FRACTURED BONES IN DOGS.

Fractured bones in dogs, writes "Wattlebark" in the "Australasian," occasionally occur, and it is advisable for dog-owners to have some idea as to how to bandage the parts to prevent further damage, and until they can be seen by a vet., or, failing that expert, to put the dog into as good a position for recovery as it is possible to do. It is a wonder that a far larger number of fractured bones do not occur with dogs, as these animals are generally in the way where traffic is the heaviest or when the unexpected happens. Dogs, however, seem to have a charmed existence, and will slip through difficulties that apparently are ready to overwhelm them. As an instance, I remember one day seeing a fox terrier standing between the metalled rails at a suburban railway station as a train came rushing in. The dog was quite unconscious of its approach, and the incident was too sudden even to give a warning yell. I could not but think that the dog was mangled, and I moved up to see what had occurred. As I did so I happened to look over to the other side of the roadway, and there I saw the noble fox terrier, with a big patch of engine grease on its shoulder—fighting with another dog.

The well-known canine specialist, Mr. A. J. Sewell, M.R.C.V.S., says that the symptoms of a fractured leg are deformity, pain, and swelling at the seat of the fracture, with crepitus or grating together of the broken ends of the bones when the parts are moved. There are three kinds of fracture—simple, when one or more bones are broken in two pieces, as in fracture of



BANDAGING A DOG'S LEG.

the two bones (radius and ulna) of the foreleg or arm, and an absence of serious injury to the skin; compound, when, besides fractures of the bones, the skin and other tissues are torn, exposing the bones; and, comminutive, when a bone is crushed into several pieces. It is, of course, possible to have a compound comminutive fracture. There is a false form of fracture that occasionally occurs in puppies, especially of the larger breeds, more particularly when affected with rickets; that is the separation of the epiphyses

from the shaft of the bone. The epiphyses are the ends of the long bones, and in young animals they are joined to the main shaft by cartilage; later this becomes ossified or converted into bone.

In the fracture of the hock or the tibia, a bone that extends from the stifle joint to the hock, the same method of treatment applies. A splint made of thin zinc, which should be shielded from the skin by a padding of medicated wool, is to be placed above and below the seat of the fracture, the broken parts having previously been brought together. If the dog is big, two splints will be necessary.

In treating fractures, Mr. Sewell states that it is important to get them set and bandaged before the parts have had time to swell, otherwise in a few days, when the swelling has disappeared, the bandage will be found loose, and perhaps coming off, necessitating resetting and bandaging. When the setting has been properly carried out there is no occasion to remove the bandages in case of simple fracture, at any rate for a month; but if the splints have not been properly padded, they may rub the prominent parts of the joints or bones, causing bad wounds. When such is occurring, the dog is restless, and shows unmistakable signs of discomfort by constantly licking the parts; then the splints and bandages must be removed, and the sores washed and dressed by sprinkling the wound over with powdered iodoform before applying the splints and bandages again. The wound may require dressing every other day, or even every day, if the wound is a bad and deep one; in these cases a pad of some antiseptic gauze, as carbolic gauze, should be applied.

In treating small dogs with fracture of the leg, it is very important that the bandages should be as thin and light as possible. In these cases, have bandages made of thin muslin, or butter-cloth, about  $1\frac{1}{2}$  in. wide by 4 yards long, which soak in a thick solution of gum acacia. This is put straight on the broken leg after it has been set. A good many layers must be put on, and over this four unpadded splints are adapted, and then a few layers of ordinary bandage to keep the splints in their place, and they, with the outside bandage, may be removed in a couple of days, by which time the gum has dried and set firmly.

Over ordinary bandages for fractures a few strips of sticking-plaster should be fixed to keep the bandages in place. The illustration will show the method of placing a bandage on a fractured leg. The bandage should be begun from the foot, and carried firmly up the leg.

### BURNING OUT STUMPS.

We have, on several occasions, described the method of burning out stumps by the help of kerosene and saltpetre, and still requests for information on the matter reach us from time to time.

The process is not a new one, nor is it confined to Queensland, for in Canada it is recognised as the most simple way of getting rid of stumps without the heavy labour of extracting them by the use of axe, mattock, and shovel.

A Canadian says:—"In treating with saltpetre, we bore from one to three holes with a sharp 2-in. auger, according to the size of the stump. If a moderate-sized stump, one hole in the centre is sufficient, or, if the stump is very large, bore two or three holes in different sections. If at an angle to the grain they will bore much easier than straight down from the top. In each hole place 1 oz. of saltpetre, fill up with rain water and plug closely with wood. The water will dissolve the saltpetre and carry it to all portions of the stump, opening up the grain pores. As soon as the water is absorbed, which will be in from four to six weeks in dead stumps, and somewhat longer in green ones, uncork, fill the hole with kerosene oil, and again cork tightly.



As soon as the oil has been absorbed, which will be in a few days, possibly one week, the stump is ready to fire. After a good fire is started, it is not much trouble to get rid of the stump. We have had a large oak stump, 5 or 6 ft. in diameter, burn entirely away, root and crown."

The dry weather of autumn and winter (in Queensland) is the best time to burn them out, as the roots then hold very little moisture to retard burning.

### WHAT A GOOD MILCH COW SHOULD YIELD.

The Canadian Department of Agriculture, in order to determine the above question, arranged a series of tests of first-class milkers, and laid down certain conditions which were accepted by local societies which entered upon the work. Amongst the conditions it was stipulated that all animals entering for the test must previously be entered in a Canadian herd-book testifying to their purity, and that the scope of the test should last for a period not exceeding one year.

The standard laid down for the Ayrshire cow is as follows:—

				Lb. Milk.		Lb. Butter Fat.
Two-year-old class	...	...	...	5,500	...	198
Three-year-old class	...	...	...	6,500	...	234
Four-year-old class	...	...	...	7,500	...	270
Mature class	...	...	...	8,500	...	306

That for the French-Canadian is as follows:—

				Lb. Milk.		Lb. Butter Fat.
Two-year-old class	...	...	...	4,400	...	198
Three-year old class	...	...	...	5,200	...	234
Four-year-old class	...	...	...	6,000	...	270
Mature class	...	...	...	6,800	...	306

### THE FLAX INDUSTRY.—DECREASED PRODUCTION.

Returns compiled by the chief fibre expert (Mr. Fulton) of hemp and tow exported during the month of February (says the "New Zealand Farmer"), show a considerable falling-off compared with the corresponding period of 1908. Although there was an increase for February over January, the output graded for last month amounted to 8,788 bales, or 4,040 bales less than for February, 1908.

The twelve months ended February, 1909, show a falling off of 63,775 bales. For the year ended 28th February, 1909, the total was 78,573 bales, whereas for the year ended 28th February, 1908, the quantity graded for export amounted to 143,348 bales.

In regard to tow, which was graded for the first time last month, 1,603 bales passed through the graders' hands. Of this, 47 bales were No. 1, 455 No. 2, and 1,063 No. 3, while 38 were condemned.

Wellington shipments of hemp amounted to 3,708 bales for the month, compared with 5,096 bales for the same month last year. Wellington also shipped 655 bales of tow.

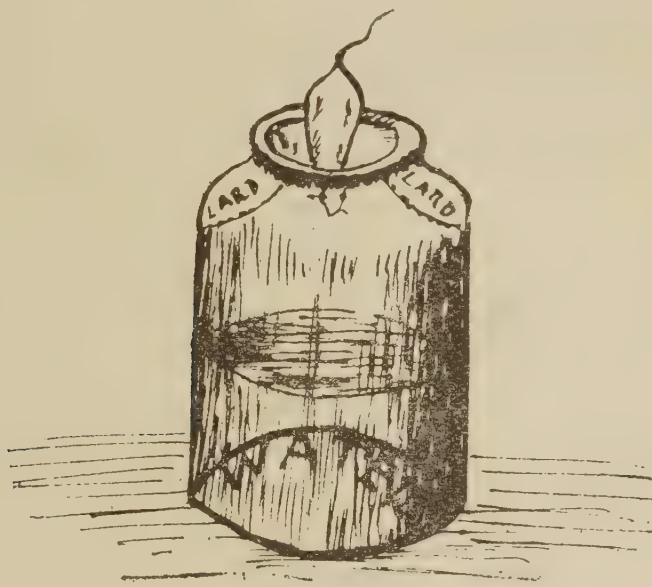
### BANANA MARGARINE.

Banana margarine is among the latest novelties now being placed on the market in England. A food expert has elaborated a process of blending bananas with milk, butter, and other wholesome ingredients, and has produced a natural food product resembling in appearance and texture choicest Danish butter, and characterised by the flavour of the banana. To protect this process, patent rights have been applied for in the United Kingdom and the Isle of Man by the inventor, and the Board of Agriculture and Fisheries has approved of the sale of the article under the name "banana margarine."

It is claimed that the product will save the housewife 25 per cent. on cost compared with butter, and give the retailer a clear profit of 25 per cent. Steps are being taken to secure patent rights on the Continent and in the colonies. The quality and flavour of the new article are stated to be excellent.—“Sydney Mail.”

#### TO DESTROY MICE IN THE GARDEN.

Traps of the following description—earthenware or glass jars, each with a good shoulder, as in the sketch—should be sunk in the ground so that the tops become level with the surface. While the jars are dry, fix some pieces of lard or dripping inside, close up underneath the shoulders, then



half fill the jars with water. The mice, in attempting to reach the lard, fall in and get drowned. These traps require very little attention, and can remain set without danger to other animals. Remove the dead mice as often as necessary.



## Answers to Correspondents.

### RINGBARKING.

J. TAIT, Tewantin.—

As a general rule the proper time to ringbark the trees you mention is when they are in full growth and the sap is up. The difficulty lies in the fact that these trees are not all in strong growth at the same time, consequently if a contract is let to ringbark, the contractors ringbark every tree on the land, with the result that many will shoot from the roots and stumps. The proper way is to note what trees are vigorously growing, and to ringbark these, leaving the rest until they also are in the same condition of growth. There is no need to ringbark oaks; better to cut them down, and the stumps will very soon begin to rot. They do not shoot from the stumps, but oaks should not be allowed to be in full seed before felling, otherwise you will have a fine crop of young trees, which will have to be pulled up when young.

### SHE OAK AND TI-TREE.

"FORESTER," Woombye.—

The "She Oak" is not an oak-tree. It belongs to the order "Casuarinæ," natives chiefly of Australia. The term "oak" is a misnomer, and as for "She Oak," that is a corruption of the native name in Tasmania, "Cheok." In the same way Tea Tree or Ti-tree has nothing to do with the Tea plant. The name is derived from "ti-ti," meaning "little leaf."

### DRIED BLOOD AND SWEET POTATOES FOR FOWLS—SWEET POTATO VINES FOR HORSES—RIPE WATERMELONS—ROUGH ANALYSIS OF SOILS.

W. E. PEARSON, Aspley, Brisbane.—

1. Is dried blood good for fowls in place of meat for laying hens?

From the analysis of dried blood it is shown that it contains everything needed for the production of eggs.

2. Are sweet potato vines good for horses?

Great care is needed in feeding sweet potato vines to any stock. Analyses of the vines have shown that they yield as much as 1 grain of prussic acid (a deadly poison) per lb. of the green feed. In 1905 numbers of pigs died from eating sweet potato vines. If used at all for stock, it should be very sparingly.

3. Are sweet potatoes good feed for laying fowls?

In feeding green food to fowls it is well to mix two or three kinds. Sweet potatoes, mangolds, cabbage, sugar-beets, and lucerne are all good.

4. Are oats good feed for laying fowls?

Yes; excellent food.

5. What is the most reliable way to tell when watermelons are ready for market?

When the melon is ripe the curl near the fruit will wither. If on pressing the melon between the hands a cracking sound is heard inside, the fruit is ripe. Never cut a hole to find out, as some do.

6. Is there any simple way to tell whether my soil lacks phosphoric acid or potash, in a rough way?

No. You can, by a rough method, ascertain the presence of humic acid, lime, magnesia, and hydrate of alumina combined with phosphoric acid, but for quantity or deficiency of phosphoric acid and potash a chemical analysis is necessary. See "Q.A.J.," Vol. XIII., Aug., 1903, p. 211, "To Roughly Ascertain the Composition of Soils."

## COST OF FERTILISER FOR MAIZE.

R. H. WITTY, Yatala.—

No. 1.				
160 lb. sulphate of potash	...	...	...	24s.
160 lb. superphosphate	...	...	...	12s.
				<hr/>
				36s. per acre
No. 2.				
160 lb. nitrate of soda	...	...	...	24s.
320 lb. superphosphate	...	...	...	24s.
160 lb. sulphate of potash	...	...	...	24s.
				<hr/>
				72s. per acre

No. 1 is not a complete manure, and requires the addition of nitrogen in the form of nitrate of soda, or of dried blood to give good results.

No. 2 is a complete manure, but contains too much superphosphate. Mr. Brännich, Agricultural Chemist, recommends as a general complete fertiliser, per acre:—

1½ cwt. nitrate of soda	...	...	...	24s.
1 cwt. potassium sulphate	...	...	...	16s.
1 cwt. superphosphate	...	...	...	8s.
				<hr/>
				78s. per acre

These are all quick-acting soluble manures, and will chiefly benefit the crop to which they are applied.

The administration of molasses to cattle has no effect whatever in preventing an attack of redwater. However, as it is, to some extent, a food, although not a well-balanced one, the feeding of molasses to an animal whilst sick may assist in keeping up the latter's strength. It also acts as a mild laxative, and therefore is beneficial for its action in that respect.

## THE QUEENSLAND AGRICULTURAL JOURNAL.

PEDAGOGUE, Teutoberg.—

The Journal is supplied to State school head teachers on payment of 1s. annually to cover postage.



## Publication Received.

### THE OFFICIAL YEAR-BOOK OF THE COMMONWEALTH, No. 2.

We have received from the Commonwealth Statistician (Mr. G. H. Knibbs, F.S.S., &c.), a copy of the second "Official Year Book" of the Commonwealth of Australia, dated 1909, and just published under the authority of the Hon. H. Mahon, M.P., Minister for Home Affairs. The first number of the Year Book, published last year, was so favourably received and was in such demand that this year it has been considered necessary to largely increase the number published.

The statistics comprised in the new volume are, as far as possible, given for each State and for every year since the inauguration of the Commonwealth, including particulars for the year 1908, so far as they have been compiled. The publication also furnishes corrected figures from the earliest times, in some cases dating as far back as 1788.

In addition to the matter usually contained in a publication of this description, the Year Book is supplemented by the inclusion of a large number of new maps, tables, diagrams, and graphs. Some of the sections given in the first Year Book have now been considerably condensed, while others have been elaborated, and new articles dealing with matters of special interest have been added.

Among the subjects on which new articles have been introduced, the following may be specially mentioned:—The Exploration of Australia (with maps); The Constitutions of the States; The Hydrology of Australia (with lengths of rivers); The Development of Australia's Trade with the East; The Customs Tariff, 1908; Kindergarten Education; Administrative Government; Public Lighting; Papua; and Local Option. The article on Manufacturing Industries has been rewritten, and contains a number of new tables, while a great part of the article on Railways is also new. The subject of Land Tenure and Settlement is dealt with exhaustively, and a comprehensive description in a classified and co-ordinated form of the land systems of the several States is published, it is believed, for the first time. A number of new maps, in addition to those comprised in the last Year Book, are also included in the publication, such, for instance, as the maps of the Geology of Australia, the Orography of Australia, the Progress of Exploration, and Australia and New Guinea.

A feature of the Year Book worthy of note is that the latest returns available up to the hour of going to press have been included in an Appendix.

It is evident in the present publication that the scheme of co-ordination of statistics outlined and agreed upon at the Statistical Conference of 1906 has resulted in considerable improvement in the collection and presentation of Australian statistics on a uniform basis, so that the returns for the several States are now in nearly every case directly comparable.

The Commonwealth Year Book is a compendium of all matters affecting the economic and industrial conditions of Australia, and is a *sine qua non* for the publicist for purposes of reference.

---

## The Markets.

### PRICES OF FRUIT—ROMA-STREET MARKETS.

Article.						MAY.
						Prices.
Apples (Hobart), per case ...	...	...	...	...	...	5s. to 8s.
Apples (Victorian), per case ...	...	...	...	...	...	4s. to 7s.
Apples (Local), per case ...	...	...	...	...	...	3s. to 4s. 6d.
Bananas (Cavendish), per dozen ...	...	...	...	...	...	2d.
Bananas (sugar), per dozen ...	...	...	...	...	...	1d. to 1½d.
Cape gooseberries, per box ...	...	...	...	...	...	8s. to 9s. 6d.
Custard Apples, per quarter-case ...	...	...	...	...	...	3s. to 5s.
Lemons (Italian), per case ...	...	...	...	...	...	9s.
Lemons (Sydney), per case ...	...	...	...	...	...	7s.
Mandarins, per case ...	...	...	...	...	...	3s. 9d. to 8s. 6d.
Oranges (Northern), per case ...	...	...	...	...	...	5s.
Oranges (Local), per case ...	...	...	...	...	...	2s. to 4s. 1d.
Papaw Apples, per quarter-case ...	...	...	...	...	...	1s. 6d.
Passion Fruit, per quarter-case ...	...	...	...	...	...	2s. 9d. to 3s.
Pears (Hobart), per quarter-case ...	...	...	...	...	...	6s.
Pears (Victorian), per quarter-case ...	...	...	...	...	...	8s. 6d. to 9s.
Persimmons ...	...	...	...	...	...	1s. 6d. to 3s. 9d.
Pineapples, rough, per dozen ...	...	...	...	...	...	2s. 6d.
Pineapples, smooth, per dozen ...	...	...	...	...	...	3s. 6d. to 4s. 6d.
Pineapples, Ripley Queen, per dozen ...	...	...	...	...	...	2s. 6d. to 3s.
Quinces, per case ...	...	...	...	...	...	1s. 7d. to 3s. 8d.
Rosellas, per sugar bag ...	...	...	...	...	...	2s. 6d.
Tomatoes, per quarter-case ...	...	...	...	...	...	1s. 9d. to 3s.

### SOUTHERN FRUIT MARKET.

Apples (Hobart), per case ...	...	...	...	...	...	6s. 6d.
Apples (Victorian), per case ...	...	...	...	...	...	4s. to 5s.
Apples (Local), per case ...	...	...	...	...	...	9s.
Apples (cooking), per case ...	...	...	...	...	...	3s. 6d to 5s.
Bananas (Queensland), per bunch ...	...	...	...	...	...	1s. to 3s.
Bananas (Queensland), per case ...	...	...	...	...	...	5s. 6d. to 7s.
Grapes (Adelaide), per box (36 lb.) ...	...	...	...	...	...	5s. 6d. to 6s.
Lemons (Local), per gin case ...	...	...	...	...	...	7s.
Lemons (Italian), per box ...	...	...	...	...	...	7s. to 8s.
Lemons (Italian), per half-case ...	...	...	...	...	...	7s. to 8s.
Mandarins (Local Emperors), special, per gin case ...	...	...	...	...	...	12s. to 13s.
Mandarins (other), per half-case ...	...	...	...	...	...	5s.
Mangoes, per case ...	...	...	...	...	...	...
Nectarines, per half-case ...	...	...	...	...	...	...
Oranges (Local), per gin case ...	...	...	...	...	...	6s.
Passion Fruit (Choice), per half-case ...	...	...	...	...	...	5s. to 6s.
Peanuts, per lb. ...	...	...	...	...	...	5½d.
Pears (Choice), per gin case ...	...	...	...	...	...	12s.
Pears (medium), per gin case ...	...	...	...	...	...	...
Pears (China), per gin case ...	...	...	...	...	...	1s. 6d. to 2s.
Persimmons, per box ...	...	...	...	...	...	3s.
Pie-melons, per dozen ...	...	...	...	...	...	1s. 2d.
Pineapples (Queensland), Ripley Queen, per case (choice) ...	...	...	...	...	...	6s. to 7s. 6d.
Pineapples (Queensland), Choice, Queens, per case ...	...	...	...	...	...	6s. to 7s. 6d.
Pineapples (Queensland), Choice Common, per case ...	...	...	...	...	...	6s. to 7s.
Pineapples (Queensland), Small, Common, per case ...	...	...	...	...	...	4s. 6d. to 5s. 6d.
Plums, per half-case ...	...	...	...	...	...	...
Quinces, per gin case ...	...	...	...	...	...	3s.
Rock melons, per dozen ...	...	...	...	...	...	2s. to 4s.
Strawberries (Local), per dozen punnets ...	...	...	...	...	...	...
Tomatoes (Local), choice, per half-case ...	...	...	...	...	...	2s. to 2s. 6d.
Water Melons, per dozen ...	...	...	...	...	...	6s.



# PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR MAY.

Article.							MAY.
							Prices.
Bacon, Pineapple...	...	...	...	...	...	lb.	8½d. to 10d.
Barley, Malting	...	...	...	...	...	"	3s. 6d. to 3s. 9d.
Bran	...	...	...	...	...	ton	£6 15s.
Butter, Factory	...	...	...	...	...	lb	1s.
Chaff, Mixed	...	...	...	...	...	ton	£5 10s.
Chaff, Oaten	...	...	...	...	...	"	£4 15s. to £5 5s.
Chaff, Lucerne	...	...	...	...	...	"	£5 5s. to £7 5s.
Chaff, Wheaten	...	...	...	...	...	"	£4 10s. to £5 10s.
Cheese	...	...	...	...	...	lb.	7½d. to 8d.
Flour	...	...	...	...	...	ton	£12.
Hay, Oaten	...	...	...	...	...	"	£5 10s. to £6.
Hay, Lucerne	...	...	...	...	...	"	£4 5s. to £6.
Honey	...	...	...	...	...	lb.	2d. to 2½d
Maize	...	...	...	...	...	bush.	4s. 3d. to 4s. 4d.
Oats	...	...	...	...	...	"	3s. 2d. to 3s. 4d.
Pollard	...	...	...	...	...	ton	£6 15s.
Potatoes	...	...	...	...	...	"	£5 to £7.
Potatoes, Sweet	...	...	...	...	...	"	...
Pumpkins	...	...	...	...	...	"	...
Wheat, Milling	...	...	...	...	...	bush.	5s. to 5s. 3d.
Wheat, Chick	...	...	...	...	...	"	4s. 9d.
Onions	...	...	...	...	...	ton	£8 to £8 5s.
Hams	...	...	...	...	...	lb.	1s. to 1s. 1d.
Eggs	...	...	...	...	...	doz.	1s. 3¼d. to 1s. 8d.
Fowls	...	...	...	...	...	pair	2s. 3d. to 3s. 6d.
Geese	...	...	...	...	...	"	5s. to 6s.
Ducks, English	...	...	...	...	...	"	3s. to 3s. 4d.
Ducks, Muscovy	...	...	...	...	...	"	3s. 9d. to 4s. 6d.
Turkeys (Hens)	...	...	...	...	...	"	6s. 3d. to 7s.
Turkeys (Gobblers)	...	...	...	...	...	"	9s. to 16s.

## ENOGGERA SALEYARDS.

Animal.							APRIL.
							Prices.
Bullocks	...	...	...	...	...	...	£7 17s. 6d. to £9 10s.
" (single)	...	...	...	...	...	...	£10.
Cows	...	...	...	...	...	...	£5 17s. 6d. to £7 7s. 6d.
Merino Wethers	...	...	...	...	...	...	14s. 9d.
Crossbred Wethers	...	...	...	...	...	...	15s.
Crossbred Wethers (single)	...	...	...	...	...	...	23s. 6d.
Merino Ewes	...	...	...	...	...	...	13s.
Crossbred Ewes	...	...	...	...	...	...	17s. 9d.
Lambs	...	...	...	...	...	...	11s. 3d.

## Farm and Garden Notes for July.

**FIELD.**—The month of July is generally considered the best time to sow lucerne, for the reason that the growth of weeds is practically checked, and the young lucerne plants will therefore not be choked by them, as would be the case if planted later on in the spring. If the ground has been properly prepared by deep ploughing, cross-ploughing, and harrowing, and an occasional shower occurs to assist germination and growth, the lucerne will thrive so well that by the time weeds once more appear, it will be able well to hold its own against them. From 10 to 12 lb. of seed will be sufficient for an acre. This is also the time to prepare the land for most field crops—such as potatoes, maize, oats, barley, rye, vetches, tobacco, cotton, sugar-cane, field carrots, mangolds, swedes, canaigre, &c. Early potatoes, sugar-cane, and maize may be planted in very early districts, but it is risky to plant potatoes in this month in any districts liable to late frosts and in low-lying ground; it is better to wait till the following month. The greatest loss in potatoes and sugar-cane has been experienced in September, when heavy frosts occurred in low-lying districts in the Southern portion of the State. During suitable weather, rice may be sown in the North. The coffee crop should now be harvested, and yams and turmeric unearthed.

**KITCHEN GARDEN.**—Should showery weather be frequent during July, do not attempt to sow seeds on heavy land, as the latter will be liable to clog, and hence be injurious to the young plants as they come up. The soil should not be reworked until fine weather has lasted sufficiently long to make it friable. Never walk over the land during wet weather with a view to sowing. The soil cakes and hardens, and good results cannot then be expected. This want of judgment is the usual cause of hard things being said about the seedsman. In fine weather, get the ground ploughed or dug, and let it lie in the rough till required. If harrowed and pulverised before that time, the growth of weeds will be encouraged, and the soil is deprived of the sweetening influences of the sun, rain, air, and frost. Where the ground has been properly prepared, make full sowings of cabbage, carrot, broad beans, lettuce, parsnips, beans, radishes, leeks, spring onions, beetroot, eschalots, mustard and cress, &c. As westerly winds may be expected, plenty of hoeing and watering will be required to ensure good crops. Pinch the tops of broad beans which are in flower, and stake up peas which require support. Plant out rhubarb, asparagus, and artichokes. In warm districts it will be quite safe to sow cucumbers, marrows, squashes, and melons during the last week of the month. In colder localities, it is better to wait till the middle or end of August. Get the ground ready for sowing French beans and other spring crops.

**FLOWER GARDEN.**—Winter work ought to be in an advanced state. The roses will now want looking after. They should already have been pruned, and now any shoots which have a tendency to grow in wrong directions should be rubbed off. Overhaul the ferneries, and top-dress with a mixture of sandy loam and leaf-mould, staking up some plants and thinning out others. Treat all classes of plants in the same manner as the roses, where undesirable shoots appear. All such work as trimming lawns, digging beds, pruning and planting, should now be got well in hand. Plant out antirrhinums, pansies, hollyhocks, verbenas, petunias, &c., which were lately sown. Sow zinnias, amaranthus, balsams, chrysanthemum tricolour, marigold, cosmos, coxcombs, phloxes, sweet peas, lupins, &c. Plant gladiolus, tuberose, amaryllis, pan-cratiun, ismene, crinums, belladonna, lily, and other bulbs. Put away dahlia roots in some warm, moist spot, where they will start gently, and be ready for planting out in August and September.



## Orchard Notes for July.

By ALBERT H. BENSON, M.R.A.C.

### THE SOUTHERN COAST DISTRICTS.

The notes for the month of June apply to July as well. The first crop of strawberries will be ripening during the month, though extra early fruit is often obtained in June, and sometimes as early as May, under especially favourable conditions. Look out for leaf-blight, and spray for same with Bordeaux mixture, also watch for the first signs of the grey mould that attacks the fruit, and spray with the sulphide of soda wash. The larvæ of the cockchafer, that eats the roots of strawberries, should be looked for, and destroyed whenever found. Pruning of citrus and other fruit trees may be continued; also, the spraying with lime and sulphur. Where the ringing borer, that either attacks the main trunk or the branches at or near where they form the head of the tree, is present, the main stems and trunks should either be painted or sprayed with the lime and sulphur wash during the month, as the mature beetles that lay the eggs that eventually turn to the borers sometimes make their appearance during the month, and unless the trees are protected by the wash they lay their eggs, which hatch out in due course, and do a lot of damage. Keep the orchard clean, so that when the spring growth takes place the trees may be in good condition. There is usually a heavy winter crop of pineapples ripening during this and the following months, particularly of smooth leaves. See that any conspicuous fruits are protected by a whisp of grass, as they are injured not only by frost but by cold westerly winds.

### THE TROPICAL COAST DISTRICTS.

See the instructions given for the month of June. Keep the orchards clean, and well worked. Prune and spray where necessary.

### THE SOUTHERN AND CENTRAL TABLELANDS.

Where pruning of deciduous trees has not been completed, do so this month. It is not advisable to leave this work too late in the season, as the earlier the pruning is done after the sap is down the better the buds develop—both fruit buds and wood buds—thus securing a good blossoming, and a good growth of wood the following spring.

Planting can be continued during the month; if possible, it should be finished this month, for, though trees can be set out during August, if a dry spell comes they will suffer, when the earlier planted trees, which have had a longer time to become established, will do all right—provided, of course, that the land has been properly prepared prior to planting, and that it is kept in good order by systematic cultivation subsequent to planting.

Do not neglect to cut back hard when planting, as the failure to do so will result in a weakly growth.

As soon as the pruning is completed, the orchards should get their winter spraying with the sulphide lime-wash, and either with or without salt, as may be wished. See that this spraying is thoroughly carried out, and that every part of the tree is reached, as it is the main treatment during the year for San José and other scale insects, as well as being the best time to spray for all kinds of canker, bark-rot, moss, lichens, &c.

Where the orchard has not been ploughed, get this done as soon as the pruning and spraying is through, so as to have the land in good order for the

spring cultivations. See that the work is well done, and remember that the best way to provide against dry spells is to keep moisture in the soil once you have got it there, and this can only be done by thorough and deep working of the soil.

When obtaining trees for planting, see that they are on good roots, and that they are free from all pests, as it is easier to prevent the introduction of pests of all sorts than to eradicate them once they have become established. Only select those varieties that are of proved merit in your district; do not plant every kind of tree that you see listed in a nurseryman's catalogue, as many of them are unsuited to our climate. The pruning of grape vines may be carried out in all parts of the tablelands other than the Stanthorpe district, where it is advisable to leave this work as long as possible, owing to the danger of spring frosts.

Where grape vines have been well started and properly pruned from year to year, this work is simple; but where the vines have become covered with long straggling spurs, and are generally very unsightly, the best plan is to cut them hard back, so as to cause them to throw out good strong shoots near the main stem. These shoots can be laid down in the place of the old wood in following seasons, and the whole bearing portion of the vine will be thus renewed.

Where vineyards have been pruned, the prunings should be gathered and burnt, and the land should receive a good ploughing.

Times of Sunrise and Sunset at Brisbane, 1909.

DATE.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.13	5.16	6.30	5.0	6.39	5.3	6.30	5.18	5 May ○ Full Moon 10 8 p.m.
2	6.14	5.16	6.31	5.0	6.39	5.4	6.30	5.19	13 „ ☾ Last Quarter 7 45 a.m.
3	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19	19 „ ● New Moon 11 42 p.m.
4	6.15	5.14	6.32	5.0	6.39	5.4	6.29	5.20	27 „ ☾ First Quarter 11 28 a.m.
5	6.15	5.13	6.32	5.0	6.39	5.5	6.28	5.20	
6	6.16	5.13	6.33	5.0	6.39	5.5	6.27	5.21	
7	6.16	5.12	6.33	5.0	6.39	5.6	6.26	5.21	
8	6.17	5.11	6.33	4.59	6.39	5.6	6.26	5.22	4 June ○ Full Moon 11 25 a.m.
9	6.18	5.10	6.34	4.59	6.39	5.7	6.25	5.22	11 „ ☾ Last Quarter 0 43 p.m.
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.23	18 „ ● New Moon 9 28 a.m.
11	6.19	5.9	6.35	4.59	6.39	5.7	6.23	5.23	26 „ ☾ First Quarter 4 43 „
12	6.19	5.8	6.35	4.59	6.38	5.8	6.22	5.24	
13	6.20	5.8	6.35	4.59	6.38	5.8	6.22	5.24	
14	6.20	5.7	6.36	4.59	6.38	5.9	6.21	5.25	
15	6.21	5.7	6.36	5.0	6.38	5.9	6.20	5.25	3 July ○ Full Moon 10 17 p.m.
16	6.22	5.6	6.37	5.0	6.37	5.10	6.19	5.26	10 „ ☾ Last Quarter 4 58 „
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.26	17 „ ● New Moon 8 45 „
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27	25 „ ☾ First Quarter 9 45 „
19	6.23	5.5	6.37	5.0	6.37	5.11	6.16	5.27	
20	6.24	5.4	6.37	5.0	6.36	5.12	6.15	5.28	
21	6.25	5.4	6.38	5.0	6.36	5.12	6.14	5.28	
22	6.25	5.3	6.38	5.0	6.36	5.13	6.13	5.29	2 Aug. ○ Full Moon 7 14 a.m.
23	6.26	5.3	6.38	5.1	6.35	5.13	6.12	5.30	8 „ ☾ Last Quarter 10 10 p.m.
24	6.26	5.3	6.38	5.1	6.35	5.14	6.11	5.31	16 „ ● New Moon 9 55 a.m.
25	6.27	5.2	6.39	5.1	6.34	5.14	6.10	5.31	24 „ ☾ First Quarter 1 55 p.m.
26	6.27	5.2	6.39	5.1	6.34	5.15	6.9	5.31	31 „ ○ Full Moon 3 8 „
27	6.28	5.2	6.39	5.2	6.33	5.15	6.8	5.32	
28	6.28	5.1	6.39	5.2	6.33	5.16	6.7	5.32	
29	6.29	5.1	6.39	5.2	6.32	5.16	6.6	5.32	
30	6.29	5.1	6.39	5.3	6.32	5.17	6.5	5.33	
31	6.30	5.0	...	...	6.31	5.17	6.4	5.33	





# LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	11 and 12 Feb.	
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...		
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	...	28 July
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	3 and 4 Sept.	
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Belli Creek, <i>viâ</i> Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	1 and 2 July
Blackall ...	Barcoo Pastoral Society ...	...		
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	13 and 14 May	
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	Nicol Robinson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	10, 11, 12, 13, 14, & 15 Aug.	
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruit-growers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...		
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	20 and 21 July	
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...		
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...		
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson ...		
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Olermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ..		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	16 Sept.	
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	8 June	
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Coulson ...	Coulson Farmers' Progress Association	Arthur Cockroft ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ...	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	26 May	4 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	9 and 10 June	
Gayndah ...	Reid's Creek Farmers' Progress Association	P. A. Fortescue ...		
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	3 June	
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Canegrowers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association...	Thos. Smith ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...		
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...		
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ...	Gympie Horticultural Society ...	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway		
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	14 and 15 Aug.	
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...		
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...		
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...		28 and 29 April
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...		
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...		
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	24 June	
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	17 and 18 June	
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...		
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	24, 25, and 26 June	
Miriam Vale	Miriam Vale Farmers' Association ...	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ...	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...		
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	10 and 11 July	
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon ...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	9 Sept.	
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pie and Eel Creek	Pie and Eel Creek Farmers' Progress Association	David Webster, junr.		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	29 Jan.	
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...		
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ..		
Rockhampton	Mount Etna Farmers and Selectors' Progress Association	G. Smith ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	11, 12, and 13 June	
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson		
Roma (Blythedale)	Warooby Farmers' Association ...	Geo. Munt... ..		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Rosewood ...	Farmers' Club ... ..	P. H. Adams ...	15 and 16 July	
Southport ...	Southport Horticultural Society ...	E. Fass ...	25 Sept.	
Springsure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springsure ...	The Springsure Pastoral and Agri- cultural Society	H. E. Laver ...	30 April	
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	20 and 21 Feb.	
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...		
Sydney ...	Royal Agricultural Society of New South Wales	...		
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Associa- tion	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Associa- tion	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoora ...	Tingoora Farmers' Progress Asso- ciation	Jas. McKenzie ...		
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...		
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren ...	Woodend Farmers' Club ...	W. Lehfeltdt ...		
Warren Siding	The Stanwell United District Far- mers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...		
Wellington Point	Wellington Point Agricultural, Horti- cultural, and Industrial Association	E. Ziegenfusz ...		
West Haldon, <i>via</i> Green- mount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Associa- tion	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Associa- tion	W. W. Finnimore		
Woolloon- gabbya	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	15 and 16 July	
Woombye ...	Woombye Fruitgrowers' and Pro- gress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Asso- ciation	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Asso- ciation	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yerra (Mungar Junction)	Yerra District Farmers' Progress Association	H. W. Williamson		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	E. H. Decker ...	10 Oct.	

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1908.

Number of meetings held by the Society during 1908.

Date of the last meeting.

Name of the Secretary for 1909.



## Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

### NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

### THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

### "QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.



## DIRECTIONS FOR FORWARDING SPECIMENS

(ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

## INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (See “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food-plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.



## PLANT DISEASES.

## PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 48 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

## GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

## POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

*The Entomologist—Department of Agriculture and Stock, Brisbane.*

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,  
October, 1908.

**DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.**

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,  
Principal Veterinary Surgeon and Bacteriologist.

---

## **QUEENSLAND AGRICULTURAL COLLEGE.**

### **FOR SALE.**

---

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.

LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

---

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

---

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.  
Shorthorn Bull, BURTON SPOT.

---

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

---

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.



## QUEENSLAND AGRICULTURAL COLLEGE.

---

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

### TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

### BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fourteen to sixteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Fourteen Years.

---

## HERMITAGE STATE FARM.

---

### FOR SALE.

---

FIVE PURE GLENGALLAN MERINO RAMS, 20 Months old. Hand-shorn as lambs, and again in October, 1908, when they averaged 16 lb. of high-class wool. PRICES from £5 to £10.

Apply to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane; or to THE MANAGER, State Farm, Hermitage, Warwick.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

### FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.

## STATE FARM, WESTBROOK.

### GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

### CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

### POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

---

## PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.



## STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

### RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam ( <i>Ficus elastica</i> ) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber ( <i>Hevea brasiliensis</i> ) } ...	Plants ...	" " ...	3d. each
" " " " } *	Seed ...	Feb. to April	1s. per oz. (about 1 doz.)
Central American ( <i>Castilloa elastica</i> ) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
" " " " ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber ( <i>Funtumia elastica</i> ) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber ( <i>Manihot Glaziovii</i> ) ..	Seed only	" " ...	1s. per oz. (about 50)
West African Rubber ( <i>Tabernaemontana</i> ) ...	Plants ...	" " ...	6d. each, 5s. per doz.
" " " ( <i>Crassa</i> ) ...	Seed ...	" " ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

\* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE  
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,  
Brisbane, 6th August, 1907.

---

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters  
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15  
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of  
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,  
Westminster Chambers, Victoria street, London, S.W.

---

“THE QUEENSLAND FLORA”

BY F. MANSON BAILEY, F.L.S.,

*Colonial Botanist of Queensland.*

---

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

---

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO.

---

Price, £1 10s. for Complete Work.

---

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.



# STUMPING AND GRUBBING.

Be Up to Date and Use the Very Latest and Best Appliances.



WALLABY JACK.

**TREWHELLA BROS.'**

**"Monkey" and "Wallaby" Jacks**

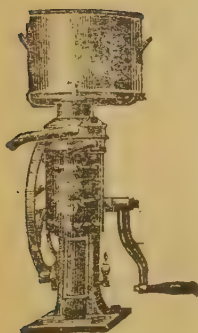
ARE

**UNAPPROACHABLE FOR THIS WORK.**

They Save Time, Money, and Labour; and are within the reach of all.  
SEND FOR CATALOGUES TO—

**A. ROBINSON,**  
**55 ADELAIDE STREET, BRISBANE.—(Queensland Depot.)**

## Standard Cream Separators.



A Number of these have now been used in Queensland for over two years, and have proved themselves

**CLEAN SKIMMING, EASY RUNNING, STRONG, AND SIMPLE.**

Gal.		£	s.	d.	Gal.		£	s.	d.
6½	...	3	5	0	44	...	12	15	0
11	...	4	5	0	56	...	14	10	0
16	...	7	5	0	66	...	15	15	0
24	...	9	15	0	100	...	22	5	0
33	...	11	15	0	133	...	28	10	0

**With Two Years' Written Guarantee. Trial if Required.**

Why Pay More for other Machines over which the STANDARD has many Advantages?

Send Post Card for Catalogue with Testimonials from Users.

THIS WILL NOT APPEAR AGAIN, SO PLEASE CUT OUT FOR REFERENCE.

**P. HANSEN, Wharf street, Brisbane.**

# LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	11 and 12 Feb.	2 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...		
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith		
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	3 and 4 Sept.	
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Beenleigh ...	The Logan and Albert Canegrowers and Farmers' Association	Wm. Thorsborne ...		
Belli Creek, <i>via</i> Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	29 and 30 July
Blackall ...	Barcoo Pastoral Society ...	...	13 and 14 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	H. R. Beverley ...		
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...	10, 11, 12,	7 to 21 August
Brisbane ...	Queensland Acclimatisation Society	Nicol Robinson ...		
Brisbane ...	Queensland National Agricultural, and Industrial Association (Jubilee of Queensland)	Charles A. Arvier		
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...		
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...	20 and 21 July	
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...		
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Cairns ...	Hambledon Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...		
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...		
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson...		
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ...		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	16 Sept.	
Columboola...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	8 June	
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Coulson ...	Coulson Farmers' Progress Association	Arthur Cockcroft ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ..	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Degilbo ...	Degilbo District Farmers and Dairymen's Association	Thos. Brennan ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	26 May	4 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	9 and 10 June	
Gayndah ...	Reid's Creek Farmers' Progress Association	R. E. Wragge ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.		
			1908.	1909.	
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...	3 June	3 Feb.	
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...			
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...			
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...			
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...	23 Jan.		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...			
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...			
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher...			
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	14 and 15 Aug.		
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..			
Gympie ...	Gympie Horticultural Society ..	Charles Brasch ...			
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...			
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...	14 and 15 Aug.		10 Feb.
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...			
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...			
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...			
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...			
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...			
Herbert River	Halifax Planters' Club ...	A. Campbell ...			
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...			
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...			
Herbert River	United Farmers' Association ...	D. G. Scott ...			
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway			
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...	14 and 15 Aug.	28 and 29 April	
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...			
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...			
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...			
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson			
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...			
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...			
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour...			
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...			
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...	...		10 Feb.
Kolan, North	Kolan Cane-growers and Farmers' Association	Jas. H. Hendy ...			
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...			
Killarney ...	Killarney Agricultural Society ...	...			
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...	...	28 and 29 April	
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...			
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...			
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith			
Lakeside ...	Mungore Farmers' Association ...	A. Reedman ...			



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...		
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	24 June	
Ma Ma Creek, <i>via</i> Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	17 and 18 June	
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...		
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	24, 25, and 26 June	
Miriam Vale	Miriam Vale Farmers' Association ...	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ..	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	...	25 and 26 March
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	10 and 11 July	
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	9 Sept.	
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pie and Eel Creek	Pie and Eel Creek Farmers' Progress Association	David Webster, junr.		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	29 Jan.	27 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...		
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Mount Etna Farmers and Selectors' Progress Association	G. Smith ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	11, 12, and 13 June	
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson		
Roma (Blythedale)	Warooby Farmers' Association ...	Geo. Munt...		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ..	Farmers' Club ... ..	P. H. Adams ...	15 and 16 July	
Southport ...	Southport Horticultural Society ...	E. Fass ...	25 Sept.	
Springsure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springsure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...	30 April	
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	20 and 21 Feb.	18 and 19 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...		
Sydney ...	Royal Agricultural Society of New South Wales	...		
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoora ...	Tingoora Farmers' Progress Association	Jas. McKenzie ..		
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...		
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren ...	Woodend Farmers' Club ..	W. Lehfeldt ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	...	23, 24, and 25 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...		
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloomgabby	Queensland Dairy Handbook Society	Alfred Gorrie ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	15 and 16 July	
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yerra (Mungar Junction)	Yerra District Farmers' Progress Association	H. W. Williamson		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	E. H. Decker ...	10 Oct.	

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1908.

Number of meetings held by the Society during 1908.

Date of the last meeting.

Name of the Secretary for 1909.

## Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

### NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

### THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

### "QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.



## DIRECTIONS FOR FORWARDING SPECIMENS

## (ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

## INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (*See* “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food-plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.



## PLANT DISEASES.

## PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 48 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

## GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

## POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

*The Entomologist—Department of Agriculture and Stock, Brisbane.*

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,  
October, 1908.



### DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,  
Principal Veterinary Surgeon and Bacteriologist.

## QUEENSLAND AGRICULTURAL COLLEGE. FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.  
LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.  
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

## QUEENSLAND AGRICULTURAL COLLEGE.

---

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

### TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

### BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fourteen to sixteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Fourteen Years.

---

## HERMITAGE STATE FARM.

---

### FOR SALE.

---

FIVE PURE GLENGALLAN MERINO RAMS, 20 Months old. Hand-shorn as lambs, and again in October, 1908, when they averaged 16 lb. of high-class wool. PRICES from £5 to £10.

Apply to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane; or to THE MANAGER, State Farm, Hermitage, Warwick.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

### FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.



## STATE FARM, WESTBROOK.

### GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

### CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

### POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

## PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.

—:0:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam ( <i>Ficus elastica</i> ) ... ..	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber ( <i>Hevea braziliensis</i> ) } ... ..	Plants ...	„ „ ...	3d. each
„ „ „ „ } ... ..	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American ( <i>Castilloa elastica</i> ) ... ..	Plants ...	Any time ...	6d. each, 5s. per doz.
„ „ „ „ ... ..	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber ( <i>Funtumia elastica</i> ) ... ..	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber ( <i>Manihot Glaziovii</i> ) .. ..	Seed only	„ „ ...	1s. per oz. (about 50)
West African Rubber ( <i>Tabernaemontana</i> ) ... ..	Plants ...	„ „ ...	6d. each, 5s. per doz.
„ „ „ ( <i>Crassa</i> ) ... ..	Seed ...	„ „ ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

\* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.



CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE  
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,  
Brisbane, 6th August, 1907.

"QUEENSLAND GOVERNMENT MINING JOURNAL,"  
PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters  
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15  
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of  
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,  
Westminster Chambers, Victoria street, London, S.W.

**"THE QUEENSLAND FLORA"**

BY F. MANSON BAILEY, F.L.S.,

*Colonial Botanist of Queensland.*

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO.

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

# STUMPING AND GRUBBING.

---

Be Up to Date and Use the Very Latest and Best Appliances.

---



WALLABY JACK.

**TREWHELLA BROS.'**  
"Monkey" and "Wallaby" Jacks

ARE

UNAPPROACHABLE FOR THIS WORK.

---

They Save Time, Money, and Labour; and are within the reach of all.  
SEND FOR CATALOGUES TO—

**A. ROBINSON,**  
**55 ADELAIDE STREET, BRISBANE.**—(Queensland Depot.)

---

---

By Authority : ANTHONY J. CUMMING, Acting Government Printer, William street, Brisbane.





# LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	11 and 12 Feb.	2 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	Chas. Bromfield ...		
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	...	28 July
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	3 and 4 Sept.	
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Beenleigh ...	The Logan and Albert Canegrowers and Farmers' Association	Wm. Thorsborne ...		
Belli Creek, <i>via</i> Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	29 and 30 July
Blackall ...	Barcoo Pastoral Society ...	...		
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	H. R. Beverley ...	13 and 14 May	5 and 6 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen (Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	Nicol Robinson ...		
Brisbane ...	Queensland National Agricultural, and Industrial Association (Jubilee of Queensland)	Charles A. Arvier	10, 11, 12,	7 to 21 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brisbane ...	Jersey Cattle Society of Queensland	Alfred Gorrie ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...		
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	A. H. Clarke ...	20 and 21 July	12 and 13 Aug.
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Cairns ...	Hambledon Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons ...		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...		
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...		
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson...		
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ...		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	16 Sept.	
Columboola...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	8 June	
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Coulson ...	Coulson Farmers' Progress Association	Arthur Cockroft ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ..	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Degilbo ...	Degilbo District Farmers and Dairymen's Association	Thos. Brennan ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	26 May	4 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	9 and 10 June	1 and 2 June
Gayndah ...	Reid's Creek Farmers' Progress Association	R. E. Wragge ...		

## AGRICULTURAL AND HORTICULTURAL SOCIETIES—continued.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	Chas. M. Morris ...	3 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association...	Thos. Smith ...	23 Jan.	3 Feb.
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...		
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...		
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen .. ...		
Gympie ...	Gympie Horticultural Society	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Witcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway		
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...		
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson	14 and 15	
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	Aug.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...		
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Killarney ...	Killarney Agricultural Society ...	...	...	10 Feb.
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...		28 and 29 April
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...		
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	A. Reedman ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...		
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	24 June	
Ma Ma Creek, <i>via</i> Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	17 and 18 June	
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruckshank ...		
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	24, 25, and 26 June	
Miriam Vale	Miriam Vale Farmers' Association...	J. Spencer ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	...	17 and 18 May
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ...	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	...	25 and 26 March
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	10 and 11 July	
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	9 Sept.	
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pie and Eel Creek	Pie and Eel Creek Farmers' Progress Association	David Webster, junr.		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	29 Jan.	27 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...		
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Mount Etna Farmers and Selectors' Progress Association	G. Smith ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	11, 12, and 13 June	10, 11, and 12 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson		
Roma (Blythedale)	Warooby Farmers' Association ...	Geo. Munt... ..		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Rosewood Farmers' Club ...	P. H. Adams ...	15 and 16 July	
Southport ...	Southport Horticultural Society ...	E. Fass ...	25 Sept.	
Springure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springure ...	The Springure Pastoral and Agricultural Society	H. E. Laver ...	30 April	
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	20 and 21 Feb.	18 and 19 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...		
Sydney ...	Royal Agricultural Society of New South Wales	...		
Tabragalba...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	W. J. Sorensen ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoora ...	Tingoora Farmers' Progress Association	Jas. McKenzie ...		
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...		
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren ...	Woodend Farmers' Club ...	W. Lehfeldt ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	...	23, 24, and 25 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...		
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloomgabby	Queensland Dairy Herdbook Society	Alfred Gorrie ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	15 and 16 July	
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yerra (Mungar Junction)	Yerra District Farmers' Progress Association	H. W. Williamson		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Thos. Crompton ...	10 Oct.	25 Sept.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1908.

Number of meetings held by the Society during 1908.

Date of the last meeting.

Name of the Secretary for 1909.

## **PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.**

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

## Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

### NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

### THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

### "QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.



## DIRECTIONS FOR FORWARDING SPECIMENS

(ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

## INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (See “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food-plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.



## PLANT DISEASES.

## PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 18 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

## GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

## POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

*The Entomologist—Department of Agriculture and Stock, Brisbane.*

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,  
October, 1908.



### DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,  
Principal Veterinary Surgeon and Bacteriologist.

## QUEENSLAND AGRICULTURAL COLLEGE. FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.

LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.

Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

## QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

### TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

### BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fourteen to sixteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Fourteen Years.

## HERMITAGE STATE FARM.

### FOR SALE.

PURE GRADED SEED WHEATS FOR SALE. Price, FIVE SHILLINGS per Bushel, f.o.b. rail.

Hermitage, Nos. 1, 2, 3. Average yield per acre, 37 Bushels.

Bunge, No. 1. " " 27½ "

S.A., No. 52. " " 31 "

Application should be made direct to THE MANAGER, State Farm, Hermitage, accompanied by a Remittance, to cover cost of Seed and Freight, up to 15th April.

FIVE PURE GLENGALLAN MERINO RAMS, 20 Months old. Hand-shorn as lambs, and again in October, 1908, when they averaged 16 lb. of high-class wool. PRICES from £5 to £10.

Apply to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane; or to THE MANAGER, State Farm, Hermitage, Warwick.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

### FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.



## STATE FARM, WESTBROOK.

---

### GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

---

### CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

Seeds: Seed will be available during the cool months of the year. The best time for sowing is from March to August. The seed is not free from husk.

Price: TWENTY SHILLINGS per Pound, or TWO SHILLINGS AND SIXPENCE per Packet; POST FREE.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets or Seed, and Freight on Rootlets.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

---

### POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

## STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

### RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam ( <i>Ficus elastica</i> ) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber ( <i>Hevea brasiliensis</i> ) ...	Plants ...	„ „ ...	3d. each
„ „ „ „ } *	Seed ...	Feb. to April	1s. per oz. (about 1 doz.)
Central American ( <i>Castilloa elastica</i> ) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
„ „ „ „ ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber ( <i>Funtumia elastica</i> ) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber ( <i>Manihot Glaziovii</i> ) ..	Seed only	„ „ ...	1s. per oz. (about 50)
West African Rubber ( <i>Tabernaemontana</i> ) ...	Plants ...	„ „ ...	6d. each, 5s. per doz.
„ „ „ (Crassa) ...	Seed ...	„ „ ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.o.b. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

\* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.



CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE  
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,  
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters  
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15  
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of  
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,  
Westminster Chambers, Victoria street, London, S.W.

STATE FARM, BUNGEWORGORAI.

SEEDS AVAILABLE FOR DISPOSAL.

WHEAT.—Bunge No. 1	...	...	} 5s. per bushel.
John Brown	...	...	
Miscellaneous Varieties	...	...	
Surplus Seed from 1907	...	3s. 6d. per bushel.	
PUMPKINS.—Cattle Varieties	...	1s. per lb.	
MAIZE.—Golden Nugget	...	5s. per bushel.	
SORGHUM.—Planters' Friend	...	2d. per lb.	

NOTE that Bags contain 3 bushels.

# LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ..	11 and 12 Feb.	2 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ..		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	Chas. Bromfield ...		
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	Geo. S. Mackersie	...	3 and 4 June
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	...	28 July
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	3 and 4 Sept.	
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Beenleigh ...	The Logan and Albert Canegrowers and Farmers' Association	Wm. Thorsborne ...		
Belli Creek, <i>via</i> Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	29 and 30 July
Blackall ...	Barcoo Pastoral Society ...	...		
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	H. R. Beverley ...	13 and 14 May	5 and 6 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper .		
Bowen(Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	Nicol Robinson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland (Jubilee of Queensland)	Charles A. Arvier	10, 11, 12,	7 to 21 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson		
Brisbane ...	Queensland Beekeepers' Association	E. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brisbane ...	Jersey Cattle Society of Queensland	Alfred Gorrie ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairy-men, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruit-growers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...		
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ..		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	A. H. Clarke ...	20 and 21 July	12 and 13 Aug.
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ..		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons ...		
Cawdor ...	Highheds and Cawdor Farmers' Association	H. Franken ...		
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...		
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...		
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson ...		
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ..		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	16 Sept.	
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	8 June	
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Coulson ...	Coulson Farmers' Progress Association	Arthur Cockroft ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ..	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Degilbo ...	Degilbo District Farmers and Dairymen's Association	Thos. Brennan ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	26 May	4 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ..		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	9 and 10 June	1 and 2 June
Gayndah ...	Reid's Creek Farmers' Progress Association	R. E. Wragge ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	Chas. M. Morris ...	3 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	3 Feb.
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...		
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...		
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen .. ...		
Gympie ...	Gympie Horticultural Society ...	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Gympie ...	Woondum and Mary River Farmers' and Progress Association	F. W. Johns ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharpy, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Witheott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway		
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden ...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...		
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson	14 and 15	
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	Aug.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...		
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour ...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Killarney ...	Killarney Agricultural Society ...	... ..		10 Feb.
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...		28 and 29 April
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...		
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	A. Reedman ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...		
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	24 June	
Ma Ma Creek, <i>viâ</i> Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	17 and 18 June	16 and 17 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...		
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	24, 25, and 26 June	
Miriam Vale	Miriam Vale Farmers' Association...	J. Spencer ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	...	17 and 18 May
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ..	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelipa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	...	25 and 26 March
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ..	10 and 11 July	
Oakey, <i>viâ</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	9 Sept.	
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>viâ</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pie and Eel Creek	Pie and Eel Creek Farmers' Progress Association	David Webster, junr.		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	29 Jan.	27 Jan
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...		
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association..	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Mount Etna Farmers and Selectors' Progress Association	G. Smith ...		
Rockhampton	Rockhampton Agricultural Society..	A. C. Lyons ...	11, 12, and 13 June	10, 11, and 12 June
Roma	Western Pastoral and Agricultural Association of Queensland	Angus McPherson		
Roma (Blythedale)	Warooby Farmers' Association ...	Geo. Munt...		
Roma	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood	Rosewood Farmers' Club ...	P. H. Adams ..	15 and 16 July	
Southport ...	Southport Horticultural Society ..	E. Fass ...	25 Sept.	
Spring-ure ...	Queensland Pastoral Society..	G. R. Milliken ..		
Spring-ure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...	30 April	
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	20 and 21 Feb.	18 and 19 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ..		
Sydney	Royal Agricultural Society of New South Wales	...		
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	W. J. Sorensen ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ..		
Tingoora	Tingoora Farmers' Progress Association	Jas. McKenzie ...		
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...		
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren	Woodend Farmers' Club ...	W. Lehfeldt ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	...	23, 24, and 25 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...		
West Haldon, <i>via</i> Green- mount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloongabba	Queensland Dairy Herdbook Society	Alfred Gorrie ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	15 and 16 July	
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yerra (Mungar Junction)	Yerra District Farmers' Progress Association	H. W. Williamson		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Thos. Crompton ...	10 Oct.	25 Sept.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1908.

Number of meetings held by the Society during 1908.

Date of the last meeting.

Name of the Secretary for 1909.

## **PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.**

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

## Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

### NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

### THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

### "QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.



## DIRECTIONS FOR FORWARDING SPECIMENS

(ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

## INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (See “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food-plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.

## PLANT DISEASES.

## PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 48 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

## GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

## POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

*The Entomologist—Department of Agriculture and Stock, Brisbane.*

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,  
October, 1908.



## DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,  
Principal Veterinary Surgeon and Bacteriologist.

## QUEENSLAND AGRICULTURAL COLLEGE. FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.

LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.

Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

## QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

### TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

### BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fourteen to sixteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Fourteen Years.

## HERMITAGE STATE FARM.

### FOR SALE.

PURE GRADED SEED WHEATS FOR SALE. Price, FIVE SHILLINGS per Bushel, f.o.b. rail.

Hermitage, Nos 1, 2, 3. Average yield per acre, 37 Bushels.

Bunge, No. 1. " " 27½ "

S.A., No. 52. " " 34 "

Application should be made direct to THE MANAGER, State Farm, Hermitage, accompanied by a Remittance, to cover cost of Seed and Freight, up to 15th April.

FIVE PURE GLENGALLAN MERINO RAMS, 20 Months old. Hand-shorn as lambs, and again in October, 1908, when they averaged 16 lb. of high-class wool. PRICES from £5 to £10.

Apply to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane; or to THE MANAGER, State Farm, Hermitage, Warwick.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

### FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.



## STATE FARM, WESTBROOK.

---

### GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

---

### CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

Seeds: Seed will be available during the cool months of the year. The best time for sowing is from March to August. The seed is not free from husk.

Price: TWENTY SHILLINGS per Pound, or TWO SHILLINGS AND SIXPENCE per Packet; POST FREE.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets or Seed, and Freight on Rootlets.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

---

### POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

## STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

### RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam ( <i>Ficus elastica</i> ) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber ( <i>Hevea braziliensis</i> ) ...	Plants ...	„ „ ...	3d. each
„ „ „ „ } * ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American ( <i>Castilloa elastica</i> ) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
„ „ „ „ ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber ( <i>Funtumia elastica</i> ) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber ( <i>Manihot Glaziovii</i> ) .	Seed only	„ „ ...	1s. per oz. (about 50)
West African Rubber ( <i>Tabernaemontana</i> ) ...	Plants ...	„ „ ...	6d. each, 5s. per doz.
„ „ „ ( <i>Crassa</i> ) ...	Seed ...	„ „ ..	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

\* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.



CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE  
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,  
Brisbane, 6th August, 1907.

"QUEENSLAND GOVERNMENT MINING JOURNAL,"

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters  
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15  
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of  
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,  
Westminster Chambers, Victoria street, London, S.W.

STATE FARM, BUNGEWORGORAI.

**SEEDS AVAILABLE FOR DISPOSAL.**

WHEAT.—Bunge No. 1	...	...	} 5s. per bushel.
John Brown	...	...	
Miscellaneous Varieties	...	...	
Surplus Seed from 1907	...	3s. 6d. per bushel.	
PUMPKINS.—Cattle Varieties	...	1s. per lb.	
MAIZE.—Golden Nugget	...	5s. per bushel.	
SORGHUM.—Planters' Friend	...	2d. per lb.	

NOTE that Bags contain 3 bushels.

# LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	11 and 12 Feb.	2 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	Chas. Bromfield ...		
Atherton ...	Atherton and North Johnstone River District Farmers' Association	David Steel Imrie		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	Geo. S. Mackersie	...	3 and 4 June
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	...	28 July
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ..	3 and 4 Sept.	
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Beenleigh ...	The Logan and Albert Canegrowers and Farmers' Association	Wm. Thorsborne ..		
Belli Creek, <i>via</i> Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	29 and 30 July
Blackall ...	Barcoo Pastoral Society ...	...		
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	H. R. Beverley ...	13 and 14 May	5 and 6 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	Nicol Robinson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland (Jubilee of Queensland)	Charles A. Arvier	10, 11, 12,	7 to 21 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ..		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ..		
Brisbane ...	Jersey Cattle Society of Queensland	Alfred Gorrie ..		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Brooyar, <i>via</i> Gympie	Brooyar Farmers' Progress Association	E. J. Pike ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...		
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	A. H. Clarke ...	20 and 21 July	12 and 13 Aug.
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address	Name of Society.	Name of Secretary.	Show Dates.	
			1908	1909.
Cairns ...	Hamblendon Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rochingham Progress Association ...	T. E. Fitzsimmons ...		
Cawdor ...	Hillfield and Cawdor Farmers' Association	H. Franken ...		
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...		
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...		
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson ..	...	27 and 28 May
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ..		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	16 Sept.	
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	8 June	
Cooran ...	Cooran Progress and Agricultural Association	A. Booth ...		
Oooroy ...	Oooroy Progress and Farmers' Association	H. V. Wood ...		
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Coulson ...	Coulson Farmers' Progress Association	Arthur Cockroft ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ..	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ..		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Scrub, <i>via</i> Degilbo				
Degilbo ...	Degilbo District Farmers and Dairymen's Association	Thos. Brennan ...		
Didcot ...	Didcot Farmers and Settlers' Association	D. B. Hamilton ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	26 May	4 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	G. A. Logan ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	9 and 10 June	1 and 2 June
Gayndah ...	Reid's Creek Farmers' Progress Association	R. E. Wragge ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	Chas. M. Morris ...	3 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association...	Thos. Smith ...	23 Jan.	3 Feb.
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...		
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...		
Gympie ..	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ..	Gympie Horticultural Society	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers Progress Association	J. Mulhally ...		
Gympie ...	Woondum and Mary River Farmers' and Progress Association	F. W. Johns ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withecott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ..		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ..	Mining, Pastoral, and Agricultural Association	John M. Hollway		
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ..		
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson	14 and 15	
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	Aug.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...		
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kilcoy ...	Kilcoy Pastoral, Agricultural, and Progress Association	John Walsh ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Killarney ...	Killarney Agricultural Society ...	...	...	10 Feb.
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...		28 and 29 April
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...		
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	A. Reedman ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1903.	1909.
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...		
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	24 June	
Ma Ma Creek, <i>via</i> Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	17 and 18 June	16 and 17 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...		
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Pastoral and Agricultural Society	H. A. Jones ...	24, 25, and 26 June	23, 24, and 25 June
Miriam Vale	Miriam Vale Farmers' Association ...	J. Spencer ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	...	17 and 18 May
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ..	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	...	25 and 26 March
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	S. A. French ...	10 and 11 July	25 and 26 June
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	9 Sept.	
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pie and Eel Creek	Pie and Eel Creek Farmers' Progress Association	David Webster, junr.		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	29 Jan.	27 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...		
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Mount Etna Farmers and Selectors' Progress Association	G. Smith ...		
Rockhampton	Rockhampton Agricultural Society..	A. C. Lyons ...	11, 12, and 13 June	10, 11, and 12 June
Roma ..	Western Pastoral and Agricultural Association of Queensland	Angus McPherson		
Roma (Blythedale)	Warooby Farmers' Association ...	Geo. Munt... ..		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ... ..		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Rosewood Farmers' Club ... ..	P. H. Adams ...	15 and 16 July	
Southport ...	Southport Horticultural Society ...	E. Fass ... ..	25 Sept.	
Springsure ...	Queensland Pastoral Society... ..	G. R. Milliken ...		
Springsure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...	30 April	20 and 21 May
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society.	Geo. Simcocks ...	20 and 21 Feb.	18 and 19 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ..		
Sydney ...	Royal Agricultural Society of New South Wales	...		
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	W. J. Sorensen ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ..		
Tingoora ...	Tingoora Farmers' Progress Association	Jas. McKenzie ...		
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...		
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ... ..		
Warren ...	Woodend Farmers' Club ... ..	W. Lehfeldt ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	...	23, 24, and 25 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...		
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloomgabby	Queensland Dairy Herdbook Society	Alfred Gorrie ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	15 and 16 July	
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yerra (Mungar Junction)	Yerra District Farmers' Progress Association	H. W. Williamson		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Thos. Crompton ...	10 Oct.	25 Sept.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1908.

Number of meetings held by the Society during 1908.

Date of the last meeting.

Name of the Secretary for 1909.

## **PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.**

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

## **JOURNAL WANTED.**

Can any of our subscribers supply us with a spare copy of the Journal of November, 1904?

EDITOR, Q.A. Journal.

## Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below :—Queensland Agricultural College, Gatton, principal, J. Mahon ; Westbrook State Farm, Westbrook, manager, C. Ross ; Biggenden State Farm, Biggenden, manager, D. Macpherson ; Hermitage State Farm, Warwick, manager, John Liverseed ; Gindie State Farm, manager, R. Jarrott ; Kamerunga State Nursery, Cairns, manager, Howard Newport ; Roma State Farm, manager, R. Soutter ; State Farm, "Warren," Stanwell, manager, Thos. Jones ; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

### NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

### THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

### "QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.



## DIRECTIONS FOR FORWARDING SPECIMENS

(ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

## INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally, insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (See “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food-plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.



## PLANT DISEASES.

## PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 48 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

## GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

## POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

*The Entomologist—Department of Agriculture and Stock, Brisbane.*

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,  
October, 1908.



### DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,  
Principal Veterinary Surgeon and Bacteriologist.

---

## QUEENSLAND AGRICULTURAL COLLEGE. FOR SALE.

---

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.  
LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 30th November; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.  
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

## INTRODUCTION OF BEESWAX AND FOUNDATION COMB INTO CAPE COLONY.

The Department of Agriculture and Stock has received advice from Capetown of certain Regulations that have been introduced in Cape Colony dealing with the introduction of Beeswax and Foundation Comb into that Colony. In future it will not be permissible to introduce Beeswax or Foundation Comb into Cape Colony except with the permission of the Secretary for Agriculture, and then only provided the articles are accompanied by the following sworn declarations:—In the case of beeswax, the exporter must declare that the beeswax has been melted for not less than two and a-half hours at a temperature of not less than 212 deg. Fahr., while for foundation comb the exporter must declare that no bee disease of any description has existed on his premises or within 2 miles thereof.

## IMPORTATION OF POTATOES INTO WESTERN AUSTRALIA.

The Department of Agriculture and Stock has received particulars of the Regulations recently adopted in Western Australia to govern the importation of Potatoes into that State, and under these Regulations all Potatoes imported from beyond the Commonwealth have to be grown in quarantine for twelve months. Potatoes imported from other States of the Commonwealth are subject to inspection and disinfection, and to an inspection fee of 1d. per cwt. or part thereof.

---

## CHEMICAL LABORATORY.

---

### ANALYSIS OF DIPPING FLUIDS.

*Instructions for Taking and Forwarding Samples, General Remarks on Dipping Fluids, Use of Concentrates, Changes in Fluid during Dipping, &c.*

1. In order to get a true average sample of the fluid contained in a dip, the contents should be thoroughly stirred up, or the sample should be taken directly after cattle have gone through the dip.

2. The sample, collected in a clean dipper or bucket, should be filled into an absolutely clean bottle, which must be labelled. About one pint of liquid should be sent for analysis.

3. The sample should be forwarded by parcel post or by rail, securely packed, carriage paid, addressed to the

### UNDER SECRETARY FOR AGRICULTURE AND STOCK, BRISBANE.

4. A letter, giving full particulars about the sample, enclosing the prescribed fee of 10s., and the sheet of questions, answered as fully as possible, should be sent at the same time.

5. Analyses will only be carried out if these instructions are adhered to.

### GENERAL REMARKS.

It frequently happens that instead of sending a true average sample of the dipping fluid, in actual use, for analysis, samples of concentrates, or of



boilings made to strengthen the dip, are sent in to the Department, without giving us due notice of such. All such cases cause a good deal of extra trouble, delay, and expense, and it will be necessary to charge more for such analyses in future, as our present fee of 10s. per dip is fixed as low as possible, just covering the expense of the analysis, in order to encourage dipowners to have their dipping fluids regularly analysed.

Only by actual chemical analysis can the strength of any dip be accurately ascertained, so as to be certain that the dip is strong enough to kill all ticks without injuring the cattle. Every dipowner, who wishes to be absolutely certain about the efficacy of his dip, should get his solution analysed at least once every six months, and more often if heavy use requires a frequent recharging of the dips.

A very serious mistake is frequently made when using concentrates for the strengthening up of dipping fluids, by not getting the contents of the drum well mixed before a small quantity is taken out. It is almost impossible to stir the contents of a full, or even only partially full, drum of concentrate with a stick, and I would always recommend that the contents be well heated up, almost to boiling point, then stirring thoroughly before the quantity necessary to strengthen the dip, or making up a small amount of dipping solution, as for hand-dressing of cattle, is taken out of the drum. If this precaution is not observed, it is quite possible that the remainder of the contents of a drum, after withdrawal of several small lots, may contain too large an amount of arsenic, large enough to cause serious injury or even death to cattle on which a solution prepared therefrom is used.

Every now and then it happens that dipping fluids are analysed, which contain an appreciable amount of arseniate, a higher form of oxidation of arsenic, which, however, is not nearly so poisonous, and, therefore, not so effective in killing ticks, than the original form of arsenious acid (as found in white arsenic), or its solution with soda as arsenite.

This change is brought about by a very slow process of oxidation, caused by atmospheric air being intimately mixed with the dipping fluid, during the process of dipping. We have already ascertained that many chemicals like carbolic acid, tar, and resinous substances in solution help in this oxidation, but there must be other agents which are more favourable for this change. The quality of water used for the preparation of the dipping solution, surrounding soil carried in by the cattle, which have been suspected, have, in accordance with some of our experiments, no influence. It is of great importance to come to the bottom of this change, which causes great loss to dipowners.

For this reason it is desired that full particulars should be given, as far as possible, when sending in dipping fluids for analysis, by filling out the attached sheet of questions.

In Question 8, state if water is well water, or from creeks or lagoons, if pure or brackish, &c.

To answer Question 9 make, whenever possible, careful observations how the ticks are killed, by inspecting the dipped cattle frequently after dipping.

QUESTIONS REFERRING TO DIPPING FLUID TO BE ANALYSED.

- 1. Contents of dip, in gallons, when full.....  
.....
- 2. Contents, in gallons, at working level, when sample was taken.....  
.....
- 3. How long has the dipping fluid, now in the dip, been in use, since the dip was first charged or recharged?.....  
.....
- 4. How was the dipping fluid originally prepared?.....  
.....  
.....
- 5. In what manner is the strength and also the volume of liquid kept up, so as to make up for loss by dipping, evaporation, &c.?.....  
.....  
.....  
.....
- 6. What is the approximate number of cattle dipped every month?.....
- 7. When was the dip last analysed? Give date and number of analysis...  
.....
- 8. What sort of water was used in the preparation of the dipping fluid?  
.....  
.....
- 9. What is the experience with regard to killing of ticks by the dipping fluid? How many days does it take to kill all ticks?.....  
.....  
.....
- 10. Has the dipping ever caused any ill-effects to the cattle dipped, such as soreness, scalding, &c.?.....  
.....  
.....

NOTE.—Answer these questions as fully as possible, detach the sheet, and enclose in your letter, when forwarding sample for analysis.





## QUEENSLAND AGRICULTURAL COLLEGE.

---

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

### TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

### BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fourteen to sixteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Fourteen Years.

---

## HERMITAGE STATE FARM.

---

### FOR SALE.

---

FIVE PURE GLENGALLAN MERINO RAMS, 20 Months old. Hand-shorn as lambs, and again in October, 1908, when they averaged 16 lb. of high-class wool. PRICES from £5 to £10.

Apply to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane; or to THE MANAGER, State Farm, Hermitage, Warwick.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

### FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.



## STATE FARM, WESTBROOK.

---

### GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

---

### CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Seeds: Seed will be available during the cool months of the year. The best time for sowing is from March to August. The seed is not free from husk.

Price: 3 Packets for SIX SHILLINGS, or TWO SHILLINGS AND SIXPENCE per Packet; POST FREE.

Robust Stools, equivalent to about 50 roots, TWO SHILLINGS each; 3 stools for FIVE SHILLINGS, f.o.b.; larger numbers of stools at cheaper rates.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets or Seed, and Freight on Rootlets.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

---

### POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

## STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS. KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

### RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam ( <i>Ficus elastica</i> ) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber ( <i>Hevea brasiliensis</i> ) } ...	Plants ...	„ „ ...	3d. each
„ „ „ „ } ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American ( <i>Castilloa elastica</i> ) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
„ „ „ „ ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber ( <i>Funtumia elastica</i> ) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber ( <i>Manihot Glaziovii</i> ) .	Seed only	„ „ ...	1s. per oz. (about 50)
West African Rubber ( <i>Tabernaemontana</i> ) ...	Plants ...	„ „ ...	6d. each, 5s. per doz.
„ „ „ ( <i>Crassa</i> ) ...	Seed ...	„ „ ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.o.b. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

\* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.



CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE  
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,  
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters  
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15  
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of  
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,  
Westminster Chambers, Victoria street, London, S.W.

STATE FARM, BUNGWORGORAI.

**SEEDS AVAILABLE FOR DISPOSAL.**

PUMPKINS.—Cattle Varieties	...	1s. per lb.
MAIZE.—Golden Nugget	...	5s. per bushel.
SORGHUM.—Planters' Friend	...	2d. per lb.

NOTE that Bags contain 3 bushels.

# LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates	
			1908	1909.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	11 and 12 Feb.	2 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	Chas. Bromfield ...		
Atherton ...	Atherton and North Johnstone River District Farmers' Association	David Steel Imrie		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	Geo. S. Mackersie	...	3 and 4 June
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	...	28 July
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	3 and 4 Sept.	
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Beenleigh ...	The Logan and Albert Canegrowers and Farmers' Association	Wm. Thorsborne ...		
Belli Creek, <i>via</i> Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	29 and 30 July
Blackall ...	Barcoo Pastoral Society ...	...		
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	H. R. Beverley ...	13 and 14 May	5 and 6 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	Nicol Robinson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland (Jubilee of Queensland)	Charles A. Arvier	10, 11, 12,	7 to 21 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brisbane ...	Jersey Cattle Society of Queensland	Alfred Gorrie ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Brooyar, <i>via</i> Gympie	Brooyar Farmers' Progress Association	E. J. Pike ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	...	25 and 26 Aug.
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Bundaberg (Maudsleigh)	Burnett Heads Canegrowers and Farmers' Association	R. O. Strathdee ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	A. H. Clarke ...	20 and 21 July	12 and 13 Aug.
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambledon Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		
Cedar Pocket, via Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...		
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...		
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson...	...	27 and 28 May
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ..		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	16 Sept.	
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	8 June	
Cooran ...	Cooran Progress and Agricultural Association	A. Booth ...		
Oooroy ...	Oooroy Progress and Farmers' Association	H. V. Wood ...		
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Coulson ...	Coulson Farmers' Progress Association	Arthur Cockroft ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ..	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, via Degilbo	Dallarnil Farmers and Dairy-men's Progress Association	H. J. Piper ...		
Degilbo ...	Degilbo District Farmers and Dairy-men's Association	Thos. Brennan ...		
Didcot ...	Didcot Farmers and Settlers' Association	D. B. Hamilton ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, via Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	26 May	4 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., via Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	G. A. Logan ...		
Fordsdale, via Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	9 and 10 June	1 and 2 June
Gayndah ...	Reid's Creek Farmers' Progress Association	R. E. Wragge ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	Chas. M. Morris ...	3 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	3 Feb.
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...		
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...		
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ...		
Gympie ...	Gympie Horticultural Society	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Gympie ...	Woondum and Mary River Farmers' and Progress Association	F. W. Johns ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	W. H. Pimlott ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway		
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hughenden ...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ideraway ...	Ideraway Farmers' Progress Association	L. Kirkley ...		
Ingham ...	Herbert River Pastoral and Agricultural Association	P. J. Cochrane ...	...	24 and 25 Sept.
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson	14 and 15 Aug.	
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...		
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...		
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour ...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kilcoy ...	Kilcoy Pastoral, Agricultural, and Progress Association	John Walsh ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Killarney ...	Killarney Agricultural Society ...	...	...	10 Feb.
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...		28 and 29 April
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...		
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	A. Reedman ...		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...		
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	24 June	
Ma Ma Creek, <i>via</i> Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	17 and 18 June	16 and 17 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...		
Maryborough	Maryborough Horticultural Society...	H. A. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Pastoral and Agricultural Society	H. A. Jones ...	24, 25, and 26 June	23, 24, and 25 June
Miriam Vale	Miriam Vale Farmers' Association...	J. Spencer ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	...	17 and 18 May
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ..	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nambour ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	2 and 3 June
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	...	25 and 26 March
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	S. A. French ...	10 and 11 July	25 and 26 June
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	9 Sept.	
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	H. K. Nevel ...		
Pie and Eel Creek	Pie and Eel Creek Farmers' Progress Association	David Webster, junr.		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	29 Jan.	27 Jan.
Pomona ...	Pomona-Lake Cootharaba Agricultural Progress Association	Reg. S. Johnston ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...		
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1903.	1909.
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Mount Etna Farmers and Selectors' Progress Association	G. Smith ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	11, 12, and 13 June	10, 11, and 12 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson		
Roma (Blythedale)	Warooby Farmers' Association ...	Geo. Munt... ..		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ... ..		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosedale ...	The Rosedale and Tottenham Agricultural Society	F. Guérin ... ..		
Rosewood ...	Rosewood Farmers' Club ... ..	P. H. Adams ...	15 and 16 July	
Southport ...	Southport Horticultural Society ...	E. Fass ... ..	25 Sept.,	
Springsure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springsure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...	30 April	20 and 21 May
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	20 and 21 Feb.	18 and 19 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...		
Sydney ...	Royal Agricultural Society of New South Wales	...		
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	W. J. Sorensen ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoorra ...	Tingoorra Farmers' Progress Association	Jas. McKenzie ...		
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...		16 and 17 June
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ... ..		
Warren ...	Woodend Farmers' Club ... ..	W. Lehfeldt ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	...	23, 24, and 25 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...		
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		



AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1908.	1909.
Woolloom-gabba	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yerra (Mungar Junction)	Yerra District Farmers' Progress Association	H. W. Williamson		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Thos. Crompton ...	10 Oct.	25 Sept.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1908.

Number of meetings held by the Society during 1908.

Date of the last meeting.

Name of the Secretary for 1909.

## **PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.**

—:0:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

## **JOURNAL WANTED.**

Can any of our subscribers supply us with a spare copy of the Journal of June, 1904?

EDITOR, Q.A. Journal.

## Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

### NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

### THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

### "QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.



## DIRECTIONS FOR FORWARDING SPECIMENS

## (ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

## INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (See “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.



## PLANT DISEASES.

## PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 48 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

## GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

## POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

*The Entomologist—Department of Agriculture and Stock, Brisbane.*

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,

October, 1908.



### DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,  
Principal Veterinary Surgeon and Bacteriologist.

---

## QUEENSLAND AGRICULTURAL COLLEGE. FOR SALE.

---

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.  
LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 30th November; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.  
Shorthorn Bull, BURTON SPOT.  
Jersey Bull, LAST EDITION.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

## INTRODUCTION OF BEESWAX AND FOUNDATION COMB INTO CAPE COLONY.

The Department of Agriculture and Stock has received advice from Cape-town of certain Regulations that have been introduced in Cape Colony dealing with the introduction of Beeswax and Foundation Comb into that Colony. In future it will not be permissible to introduce Beeswax or Foundation Comb into Cape Colony except with the permission of the Secretary for Agriculture, and then only provided the articles are accompanied by the following sworn declarations:—In the case of beeswax, the exporter must declare that the beeswax has been melted for not less than two and a-half hours at a temperature of not less than 212 deg. Fahr., while for foundation comb the exporter must declare that no bee disease of any description has existed on his premises or within 2 miles thereof.

## IMPORTATION OF POTATOES INTO WESTERN AUSTRALIA.

The Department of Agriculture and Stock has received particulars of the Regulations recently adopted in Western Australia to govern the importation of Potatoes into that State, and under these Regulations all Potatoes imported from beyond the Commonwealth have to be grown in quarantine for twelve months. Potatoes imported from other States of the Commonwealth are subject to inspection and disinfection, and to an inspection fee of 1d. per cwt. or part thereof.

---

## CHEMICAL LABORATORY.

---

### ANALYSIS OF DIPPING FLUIDS.

*Instructions for Taking and Forwarding Samples, General Remarks on Dipping Fluids, Use of Concentrates, Changes in Fluid during Dipping, &c.*

1. In order to get a true average sample of the fluid contained in a dip, the contents should be thoroughly stirred up, or the sample should be taken directly after cattle have gone through the dip.

2. The sample, collected in a clean dipper or bucket, should be filled into an absolutely clean bottle, which must be labelled. About one pint of liquid should be sent for analysis.

3. The sample should be forwarded by parcel post or by rail, securely packed, carriage paid, addressed to the

### UNDER SECRETARY FOR AGRICULTURE AND STOCK, BRISBANE.

4. A letter, giving full particulars about the sample, enclosing the prescribed fee of 10s., and the sheet of questions, answered as fully as possible, should be sent at the same time.

5. Analyses will only be carried out if these instructions are adhered to.

### GENERAL REMARKS.

It frequently happens that instead of sending a true average sample of the dipping fluid, in actual use, for analysis, samples of concentrates, or of



boilings made to strengthen the dip, are sent in to the Department, without giving us due notice of such. All such cases cause a good deal of extra trouble, delay, and expense, and it will be necessary to charge more for such analyses in future, as our present fee of 10s. per dip is fixed as low as possible, just covering the expense of the analysis, in order to encourage dipowners to have their dipping fluids regularly analysed.

Only by actual chemical analysis can the strength of any dip be accurately ascertained, so as to be certain that the dip is strong enough to kill all ticks without injuring the cattle. Every dipowner, who wishes to be absolutely certain about the efficacy of his dip, should get his solution analysed at least once every six months, and more often if heavy use requires a frequent recharging of the dips.

A very serious mistake is frequently made when using concentrates for the strengthening up of dipping fluids, by not getting the contents of the drum well mixed before a small quantity is taken out. It is almost impossible to stir the contents of a full, or even only partially full, drum of concentrate with a stick, and I would always recommend that the contents be well heated up, almost to boiling point, then stirring thoroughly before the quantity necessary to strengthen the dip, or making up a small amount of dipping solution, as for hand-dressing of cattle, is taken out of the drum. If this precaution is not observed, it is quite possible that the remainder of the contents of a drum, after withdrawal of several small lots, may contain too large an amount of arsenic, large enough to cause serious injury or even death to cattle on which a solution prepared therefrom is used.

Every now and then it happens that dipping fluids are analysed, which contain an appreciable amount of arseniate, a higher form of oxidation of arsenic, which, however, is not nearly so poisonous, and, therefore, not so effective in killing ticks, than the original form of arsenious acid (as found in white arsenic), or its solution with soda as arsenite.

This change is brought about by a very slow process of oxidation, caused by atmospheric air being intimately mixed with the dipping fluid, during the process of dipping. We have already ascertained that many chemicals like carbolic acid, tar, and resinous substances in solution help in this oxidation, but there must be other agents which are more favourable for this change. The quality of water used for the preparation of the dipping solution, surrounding soil carried in by the cattle, which have been suspected, have, in accordance with some of our experiments, no influence. It is of great importance to come to the bottom of this change, which causes great loss to dipowners.

For this reason it is desired that full particulars should be given, as far as possible, when sending in dipping fluids for analysis, by filling out the attached sheet of questions.

In Question 8, state if water is well water, or from creeks or lagoons, if pure or brackish, &c.

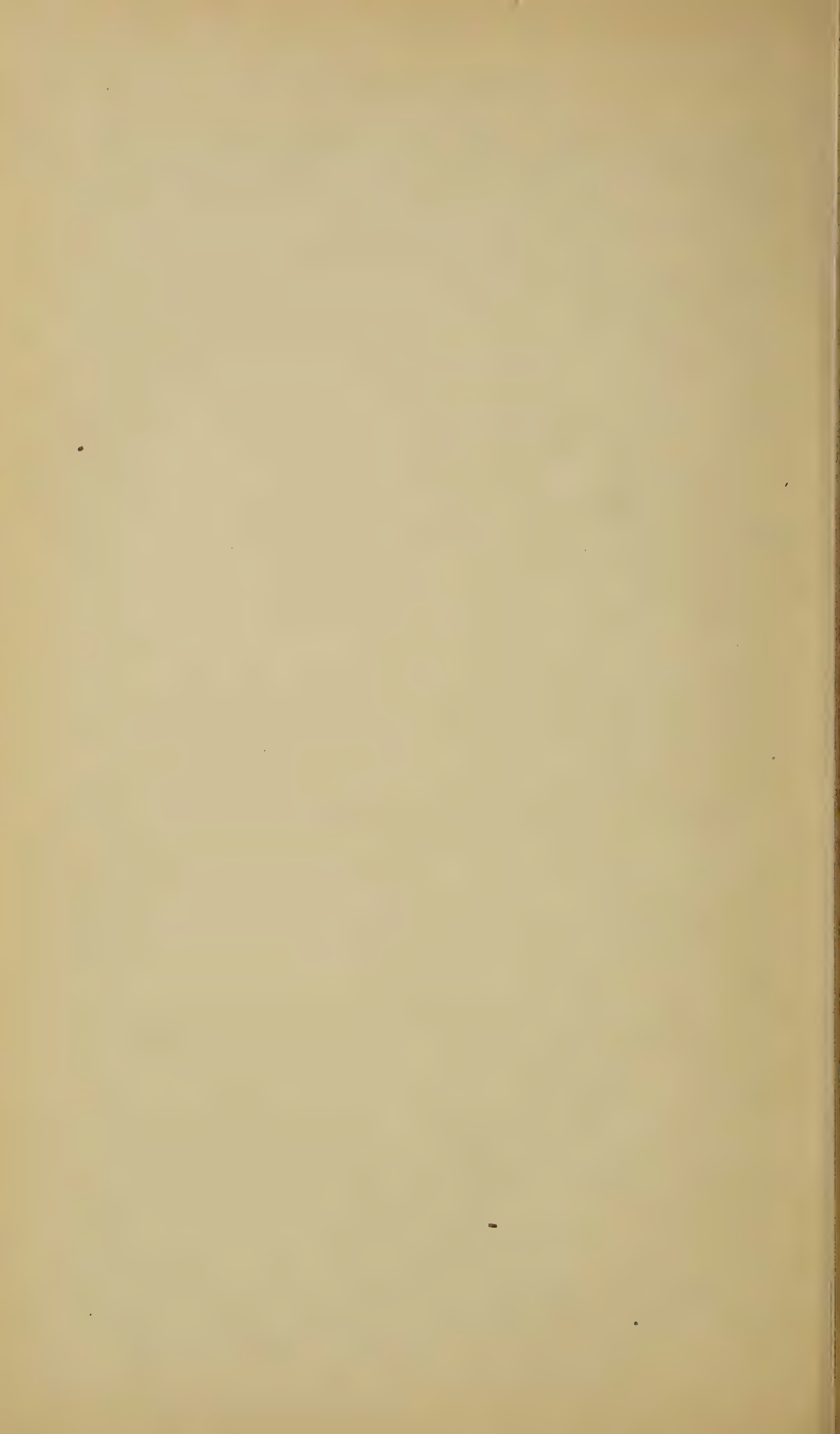
To answer Question 9 make, whenever possible, careful observations how the ticks are killed, by inspecting the dipped cattle frequently after dipping.

QUESTIONS REFERRING TO DIPPING FLUID TO BE ANALYSED.

- 1. Contents of dip, in gallons, when full.....  
.....
- 2. Contents, in gallons, at working level, when sample was taken.....  
.....
- 3. How long has the dipping fluid, now in the dip, been in use, since the dip was first charged or recharged?.....  
.....
- 4. How was the dipping fluid originally prepared?.....  
.....  
.....
- 5. In what manner is the strength and also the volume of liquid kept up, so as to make up for loss by dipping, evaporation, &c.?.....  
.....  
.....  
.....
- 6. What is the approximate number of cattle dipped every month?.....
- 7. When was the dip last analysed? Give date and number of analysis...  
.....
- 8. What sort of water was used in the preparation of the dipping fluid?  
.....  
.....
- 9. What is the experience with regard to killing of ticks by the dipping fluid? How many days does it take to kill all ticks?.....  
.....  
.....  
.....
- 10. Has the dipping ever caused any ill-effects to the cattle dipped, such as soreness, scalding, &c.?.....  
.....  
.....

NOTE.---Answer these questions as fully as possible, detach the sheet, and enclose in your letter, when forwarding sample for analysis.





## QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

### TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

### BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fourteen to sixteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Fourteen Years.

## HERMITAGE STATE FARM.

### FOR SALE.

FIVE PURE GLENGALLAN MERINO RAMS, 20 Months old. Hand-shorn as lambs, and again in October, 1908, when they averaged 16 lb. of high-class wool. PRICES from £5 to £10.

Apply to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane; or to THE MANAGER, State Farm, Hermitage, Warwick.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

### FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.

## CANARY GRASS

(*Phalaris commutata*).

Good, clean Seed of this valuable Fodder Grass is now available for Sale, on application to the Manager, at TWO SHILLINGS AND SIX PENCE per ounce packet; POST FREE. To expedite delivery, remittance to cover cost should be sent with the Order.



## STATE FARM, WESTBROOK.

---

### GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

---

### CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Seeds: Seed will be available during the cool months of the year. The best time for sowing is from March to August. The seed is not free from husk.

Price: 3 Packets for SIX SHILLINGS, or TWO SHILLINGS AND SIXPENCE per Packet; POST FREE.

Robust Stools, equivalent to about 50 roots, TWO SHILLINGS each; 3 stools for FIVE SHILLINGS, f.o.b.; larger numbers of stools at cheaper rates.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets or Seed, and Freight on Rootlets.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight

---

### POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS. KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen ; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam ( <i>Ficus elastica</i> ) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber ( <i>Hevea braziliensis</i> ) ...	Plants ...	„ „ ...	3d. each
„ „ „ „ } * ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American ( <i>Castilloa elastica</i> ) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
„ „ „ „ ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber ( <i>Funtumia elastica</i> ) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber ( <i>Manihot Glaziovii</i> ) ..	Seed only	„ „ ...	1s. per oz. (about 50)
West African Rubber ( <i>Tabernaemontana</i> ) ...	Plants ...	„ „ ...	6d. each, 5s. per doz.
„ „ „ ( <i>Crassa</i> ) ...	Seed ...	„ „ ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

\* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.



CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE  
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,  
Brisbane, 6th August, 1907.

"QUEENSLAND GOVERNMENT MINING JOURNAL,"

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters  
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15  
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of  
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,  
Westminster Chambers, Victoria street, London, S.W.

STATE FARM, BUNGEWORGORAI.

**SEEDS AVAILABLE FOR DISPOSAL.**

PUMPKINS.—Cattle Varieties	...	1s per lb.
MAIZE.—Golden Nugget	...	5s. per bushel.
SORGHUM.—Planters' Friend	...	2d. per lb.

NOTE that Bags contain 3 bushels.

# "THE QUEENSLAND FLORA"

BY F. MANSON BAILEY, F.L.S.,

*Colonial Botanist of Queensland.*

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO.

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

## STUMPING AND GRUBBING.

Be Up to Date and Use the Very Latest and Best Appliances.



WALLABY JACK.

TREWHELLA BROS.'

"Monkey" and "Wallaby" Jacks

ARE

UNAPPROACHABLE FOR THIS WORK.

They Save Time, Money, and Labour; and are within the reach of all.  
SEND FOR CATALOGUES TO—

**A. ROBINSON,**

55 ADELAIDE STREET, BRISBANE. — (Queensland Depot.)

WELL-ESTABLISHED AND INFLUENTIAL LONDON FIRM,  
**EXPERTS IN HIDES AND SKINS,**

Desires Direct Communication with reliable Australian Shippers who are in  
a position to work Business in

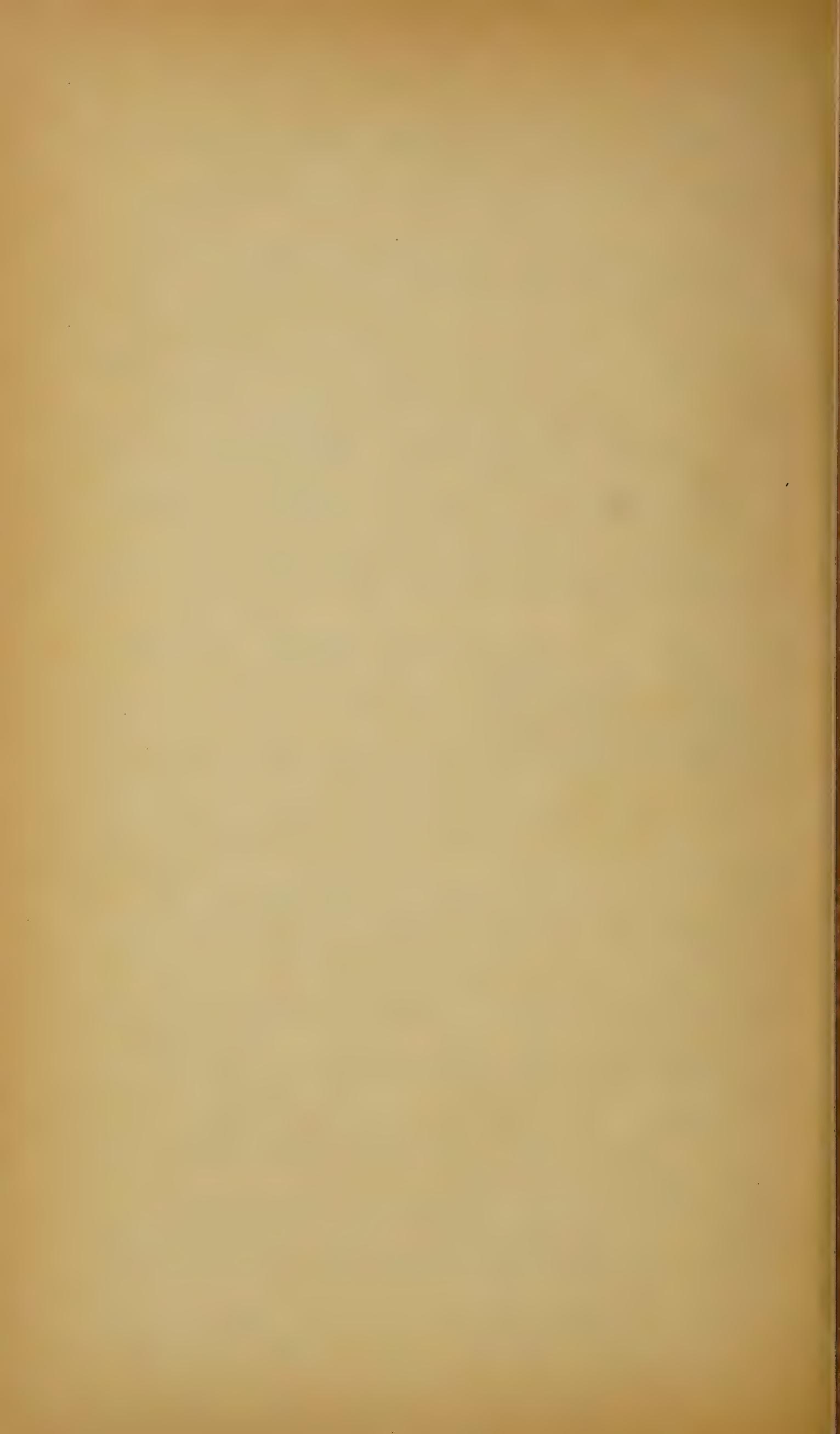
Wool, Hides, Calfskins, Sheepskins, &c., on a  
Consignment and Firm Order Basis.

Apply, in strictest confidence, to—

"MERCHANT," care of Messrs. DAWSONS,

121 Cannon Street, London, E.C.





The

U. S. P.

JANUARY,  
1909.

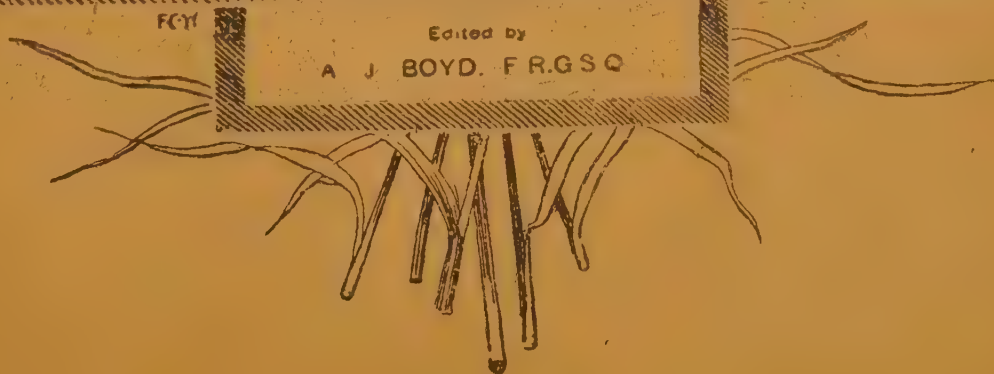
# Queensland Agricultural Journal



For terms of Subscription  
SEE PUBLIC ANNOUNCEMENTS.

FCY

Edited by  
A. J. BOYD, F.R.G.S.Q.







The



LIBRARY  
RECEIVED  
FEBRUARY  
1909  
U. S. Department of Agriculture

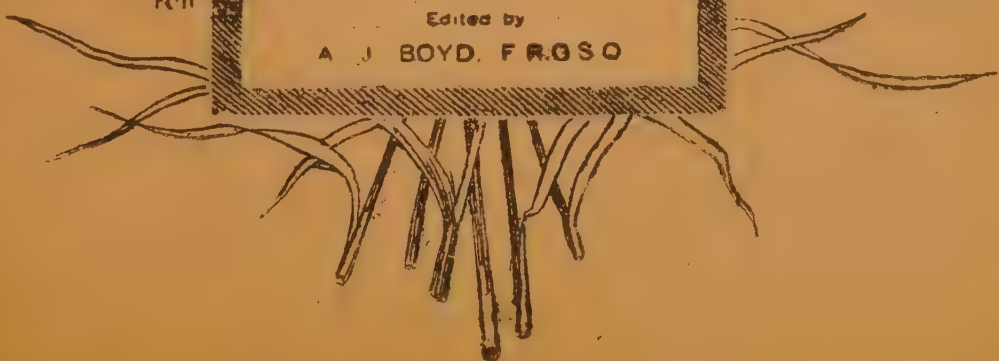
# Queensland Agricultural Journal



For terms of Subscription  
SEE PUBLIC ANNOUNCEMENTS.

FCM

Edited by  
A. J. BOYD, F.R.S.O.







The

S. Department



MARCH,  
1909.

# Queensland Agricultural Journal



For terms of Subscription  
SEE PUBLIC ANNOUNCEMENTS.

FCM

Edited by  
A. J. BOYD, F.R.G.S.O.





The



LIBRARY  
RECEIVED  
APRIL 11 1909  
U. S. Department of Agriculture

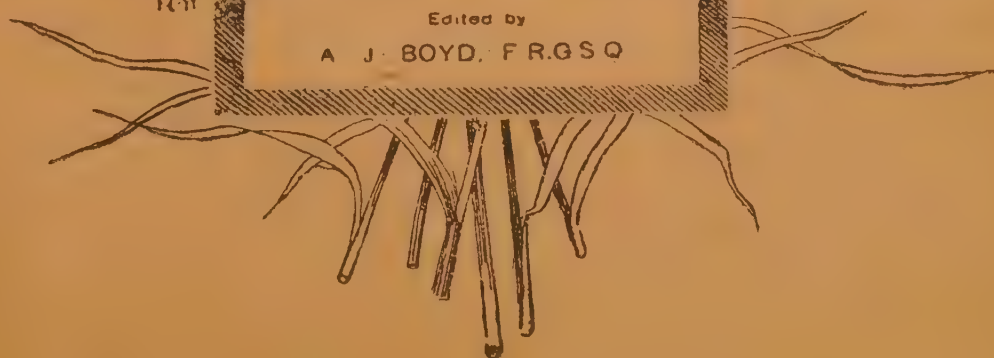
# Queensland Agricultural Journal



For terms of Subscription  
SEE PUBLIC ANNOUNCEMENTS.

FCM

Edited by  
A. J. BOYD, F.R.G.S.Q.









The

MAY,  
1909.

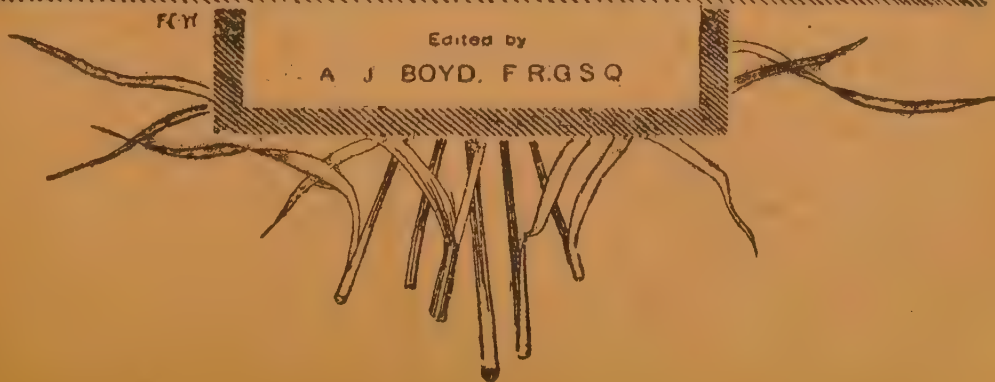
# Queensland Agricultural Journal



For terms of Subscription  
SEE PUBLIC ANNOUNCEMENTS.

FCY

Edited by  
A. J. BOYD, F.R.G.S.Q.







VOL. XXII.

PART 6.

U. S. Department of Agriculture  
JUL 8 1909

The



JUNE,  
1909.

# Queensland Agricultural Journal



For terms of Subscription  
SEE PUBLIC ANNOUNCEMENTS.

FCM

Edited by  
A. J. BOYD, FRIGSQ

